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SOUTH AFRICA is developing at a wonderful rate. The great diamond mines and the rich goldfields of the Transvaal have inaugurated a "boom" which has attracted capital and energy from nearly every part of the world, and has waked up the Rip Van Winkle Boers and started a railroad craze,

This distant field (not so distant but that the ENGINEERING AND MINING JOURNAL circulates there) has for some time been a very promising and profitable field for our makers of mining machinery, mining supplies, tools, and hardware, to cultivate; and the manufacturers of railroad supplies, locomotives, bridges, etc., will also find it to their interest to look into this new market. There appears a probability of an early confederation of the South African colonies, and of an enormous growth of railroad and mining enterprises. Johannisburg, in the Transvaal, is growing like an American city, and is the center of the mining industry.

THE announcement is made in the London papers of the formation of the Newberry-Vautin Gold Extraction Company, with a capital of £100,000.

In the ENGINEERING AND MINING JOURNAL of October 29th we showed that the entire process is old, so old in fact that the American patents taken out here years ago on parts of the "invention" were found to be valid because even these patentees were not the original inventors.

We have not noticed that any of the London papers which gave prominence to this so-called invention have given their readers the benefit of the information we furnished them, and, no doubt, their readers are eagerly buying the shares of the new company on the strength of *Engineering's* and *The Engineer's* favorable remarks. However, all of this is in London, and more or less out of our bailiwick. We feel reasonably certain no company will seek capital in New York on the Newberry—Vautin process, as described in the London papers, nor will the English readers of the ENGINEERING AND MINING JOURNAL invest their money in them either. If any one wishes to use this old, and for some cases excellent, method of treating gold ores, they can do so without paying royalty, and, consequently, the receipts of the company from this source will probably be extremely light.

THE Canadian Pacific Railway is stimulating mining at both ends o the line. Very rich gold quartz has recently been found in the Huronian rocks, near Sudbury, Ont. And in British Columbia several promising mines in argentiferous galena are being opened. One, the Illecillewaet, is on the western slope of the Selkirk range. The tunnel mouth is so immediately above the railroad track, where it follows down the Illecillewaet Creek, that the ore could be shot into the cars. The ore extracted in development is being crushed and sorted into a grade of 100 ounces for shipment to the Selby Works, San Francisco, and into a poorer grade of 40 ounces, retained for treatment on the spot when works shall have been erected. Another mine less conveniently situated is being cautiously opened by the Nicolai Mining Company, of London, England, on the Nicolai River. The lead deposits of the Kootenay District are being prospected actively by miners from Washington Territory, with very satisfactory results.

The Canadian Pacific carries ores to the coast at very low rates of freight, and the town of Vancouver, the Pacific terminus of the line, offers a bonus of $25,000 cash, which the government of British Columbia will supplement by $12,500 to any company or individual erecting smelting works of the value of $75,000 in that town. As the Bains Sound, Vancouver Island, coal cokes, fuel for metallurgical purposes will be cheap, and all other conditions are most favorable.

The progress of mineral discovery will be slow, owing to the depth of soil and the heavy clothing of timber on the mountains of British Columbia, but one find will lead to another, and the result will be healthier than where too sudden growth leads to too speedy exhaustion.

## WAGES OF MINERS IN PENNSYLVANIA ON THE SLIDING SCALE.

On another page we conclude our sketch of the history of the sliding scale system of profit sharing in the Pennsylvania coal mines, carrying our figures up to date. For much of this data we are indebted to the courtesy of the Reading Coal and Iron Company.

These tables will well repay study. It appears from them that the prices of coal at Port Carbon, which in 1869 averaged $3.20 a ton, in 1870 declined to $2.45, and in 1877 it went down to the lowest point on record, namely, $1.65 per ton. Since 1880 the price has been remarkably uniform, the variations in the prices in New York harbor varying only with the freights of the railroads. It appears, moreover, that the wages actually paid the men have been nearly always several per cent above those called for by the agreement or scale; in fact, since April, 1880, the wages paid have never been below the basis standard, though the price of coal called for a reduction of from 1 to 7 per cent below the basis. During the present year the Reading Company paid, in May, July, and August, 3 and 4 per cent above the basis, while the price of coal was at or below it.

It also appears that though the price received for coal has declined slightly within the past eight years, wages have been advanced, while the cost of living has, as every one knows, very materially decreased, as have also the prices of tools and other miners' supplies. The claim made by some of the newspapers that the miners have been "ground down,' and have had to work at starvation wages, is thus clearly disproved. They have, during the past year, been better paid, and have been able to purchase more for their day's wages than at any time since 1875. Notwithstanding this fact, the Knights of Labor, profiting by the financial condition of the Reading Company, forced a price more than 8 per cent above what the sliding scale called for, and are now keeping the miners in the Lehigh district out on strike with the expectation of forcing these higher terms on the Reading for the next year, for it is believed the present arrangement continues only until the end of the present month.

The effect of adopting the sliding scale system of profit sharing has been very beneficial to the entire industry. It has prevented serious strikes during the many years it has been in operation—until this outside organization, the Knights of Labor, came in to break it up. And it has been especially beneficial to the workmen, who have received a larger proportion of the value of coal than they formerly did, and whose

wages have actually advanced, though the cost of producing coal increased and the selling price declined.

It is quite possible that experience may have suggested some modifications in the basis as desirable; if so, we believe a request from the miners to their employers to discuss the matter, without interrupting work, would be granted, and reasonable suggestions from either side would be adopted.

The principle of the sliding scale, in which wages are based upon the selling price of the article produced, appears to us to be both practical and just. In operation it has been shown to be such a simple and effective method of "profit sharing" that we trust it will receive a constantly widening application in other departments of industry.

## THE CALUMET & HECLA MINE FIRE.

The boom in the price of Lake copper, which is now selling here at 16 cents a pound, and of Chili bars in London, which has reached £67 15s. per ton, as against £39 5s. at the corresponding date a year ago, and Best Selected, the brand most nearly approaching our Lake copper, which is now quoted £68 10, as against £45 December, 1886, though not originally due to the Calumet & Hecla, has been greatly intensified by this unfortunate accident.

The readers of the ENGINEERING AND MINING JOURNAL have been fully prepared for a large advance in the price of copper, an advance that the cost of production rendered absolutely certain. This expected rise, instead of commencing a year ago and moving gradually in accordance with the statistical and technical conditions of the industry, has come suddenly and has bounded upwards with an energy that must soon bring on a relapse, not, of course, to the old ten-cent basis, but to a degree that may tend to demoralization. Copper is now higher than it should be, even considering the immense help the market is receiving from the Calumet & Hecla fire. This is, under the circumstances, a very important matter, and we have sought to obtain from disinterested sources the fullest information possible concerning it.

From good sources we learn that the fire now burning had gained much greater headway before the shafts were battened down than that which preceded it, and it would seem that the fire has come nearer the surface. Presumably, then, the damage to No. 1 shaft will be greater than to No. 2.

How the fire originated is a puzzle to every body, and it is consequently generally concluded that it was of incendiary origin.

It is stated now that the fire in No. 2 shaft some months ago, which was accounted for by "a boy with oily waste thawing out the pump exhaust," must have been set, for when the platform on which the pump is set was reached, since work was resumed, it was found that the fire had not come near it.

The closing of shafts at once checks combustion, and the forcing of carbonic acid gas into the mine will, of course, help to extinguish the fire; but when the burning material will be so cooled off that it will not reignite on the access of fresh air is pretty much a matter of guess, which can only be settled when the mine is reopened.

A gas-pipe, the outer end of which is plugged, leads from the surface to a few feet below the shaft collar. At stated times a thermometer is dropped down, and the temperature noted. One day it gets hotter and the next colder, presumably as the underground currents vary. This and an analysis of the gas which comes through the pipe are the indications on which to guess at the condition of the fire.

The remains of the old fire about No. 2 shaft were still smouldering when this took place, but it would seem scarcely possible that this fire should come from that.

The indications are that it will continue to burn longer than the former fire, and that the mine cannot be reopened during the remainder of this month and possibly not for a much longer time.

The loss to the company must be very heavy, but it is so rich it could afford it, and would only have to cut off one or two of its dear little extravagances to make up for this unexpected expense. To the thousands of workmen it will be a very severe blow, for the other mines are full handed, and the stoppage of work at many of the iron mines of Michigan increases the difficulty of getting work elsewhere.

**A New Electrical Street-Car Motor.**—A new street-car driven by electricity, differing from all others which use this motor, is being tried at Philadelphia, Pa. The source of power is electricity stored in accumulators or secondary batteries and utilized by electric motors which are geared to the axles. The car is much larger than the ordinary street car, and it is believed to be the longest street railway car in the world. It measures over all thirty feet and its inside measurement is twenty-two feet. It is mounted on two trucks, each having four wheels, and each truck bears an independent electric motor. Except for its size, the car does not differ in general appearance from the large cars used by the Traction Company. The company proposes building not only the apparatus for cars driven by a storage battery, but also other forms with overhead conductors and sim ilarsystems.

## CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.

### Trough Lixiviation.

EDITOR OF THE ENGINEERING AND MINING JOURNAL:

SIR: I venture to put into writing the objections I noted against "Trough Lixiviation" as carried out at the North Mexican mill and which I am assured by several can be considered as applying to this method generally. As stated in a previous note to your journal, the great drawback to this method proceeds from the difficulty or rather impossibility of separating the solution from the ore after it is once in the tubs. That the solution does its work quickly in the troughs is quite true; but what happens when it reaches the tanks? The ore suspended in the solution deposits itself according to the weight and size of the particles. The coarse sand first deposits itself, following this comes the lighter portion of the ore, until finally only the dust remains in suspension, depositing but slowly or not at all, until the tank is full and left undisturbed. The mud thus formed on the surface of the charge prevents all leaching by filtration, being practically impervious to the solution, so that all solution enclosed "within" the ore is lost, together with the silver dissolved by it. The amount of solution thus lost varies with the amount necessary to saturate the ore, generally being in the neighborhood of 10 cubic feet per ton of pulp.

Again, as the time necessary for a proper settlement of the ore is too long for practical purposes, the solution has to be drawn off, from necessity, before it has properly settled, and therefore in a very turbid condition, affecting the sulphides to a corresponding degree. Thus at the North Mexican the sulphides from two mill runs of 450 tons and 300 tons (roughly), respectively yielded sulphides assaying 2953 ounces and 1822 ounces per ton of 2000 pounds. Whereas sulphides produced by ordinary leaching on the same kind of ore yielded on assay from 9506 to 15,877 ounces per ton. This great difference is almost entirely due to the quantity of fine sand remaining suspended in the solution when drawn off for precipitation. Of course such low sulphides can not be directly cupelled with lead, but require further preliminary treatment.

That these arguments have some truth in them is seen from the fact that although tried in various mining districts this method has in no place been adopted. HARRY CHANEY.

CUSIHUIRIACHIC, CHIHUAHUA, Mexico, Nov. 8.

[If the settlement of the fine pulp from the solution be the only or main difficulty in the use of this process, it should present no great obstacle to its introduction, for it is certainly very easy to settle the suspended matter in passing the solution through proper serpentine settlers of sufficient length, a duplicate set allowing one set to be cleaned while the other is in use.—ED. E. AND M. J.]

### The Oxidation of Silicon by Ferrous Oxide.

[*Continued from Page* 392.]

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In regard to the formula in dispute, I would say that Mr. Howe adds to his formula (at the head of Table 42): $C + O = CO$.

If this addition is intended to refer specifically to *one* of the two, after reaction, in the blown but still liquid steel:

(1.) $2FeO + Si = 2Fe + SiO_2$. $\begin{cases} (2.)\ 2CO + Si = 2C + SiO_2\text{; or} \\ n\,Fe + 2CO + Si = Fe_nC + SiO_2, \end{cases}$

then I do not understand why the $3FeO + Si$ formula should be connected with the $C + O$ reaction; for, if Si becomes oxidized by *FeO*, it cannot become oxidized, at the same time and temperature, by *CO*.

I merely cite this in order to make it clear that the oxidation of the Si stands in no direct connection with the subsequent combination of $SiO_2$ with FeO. Whether the $SiO_2$ comes from the one or other source, it meets FeO, which has been produced by the action of the blast and in part perhaps also by subsequent reactions, and has to combine with it in fixed proportions. Mr. Howe says, we can not tell what these proportions are, that it does not make much difference any way, and that he has chosen the formula most convenient to him. In opposition to such views, I claim that there must be a primary combination of $SiFe_2O_4$, and that $SiFeO_3$ can only be formed by the saturation of $SiFe_2O_4$ with more $SiO_2$, or by the saturation of a silicate more acid than $SiFeO_3$, and also derived from a primary combination, with more FeO. I also claim that the recognition of "only one possible mode of primary combination" is *indispensable* for arriving at a complete determination of the relative or reciprocal functions of C, Si, Mn, P and O, in the metallurgical treatment of iron.

I do not dispute that a ferrous silicate with 44 or even more per cent of silica can be produced in recarburizing overblown metal, because is is, from my standpoint, quite evident that $2FeOSiO_2$ will saturate energetically with $SiO_2$, even at a lower temperature than that which was required for primary combination; nor does Mr. Howe dispute that a monosilicate slag is a more desirable ingredient in blown steel, if slag there must be, than a more silicious one.

If the occurrence of the whitish powder, mentioned by Mr. Howe, is to be accounted for by the mode of combination, it would seem that either too much loss of heat, at that particular spot, had prevented the copious formation of primary silicates, or that there was not sufficient of FeO within the reach of the silica and that the primary silicates which had been formed were consequently restricted to acid saturation.

After these explanations, Mr. Howe will probably understand that I came pretty near to the mark, or at least to *my* mark, in raising my objection just at that point where I found it necessary to do so for the protection of the theory, an essay on which, contributed by me, was published in the same number of the ENGINEERING AND MINING JOURNAL in which Mr. Howe's work made its first appearance, and that my criticism is confined, or intended to be confined, to matters colliding with that theory. Respectfully, A. D. ELBERS.

HOBOKEN, Nov. 28, 1887.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Replying to Mr. Elbers I have merely to say that I regret I have not the leisure to discuss the interesting question of primary combina-

tions: that I dissent wholly from his views as to the recognition of a single possible primary combination: that my remarks and formulæ evidently referred solely to ultimate combinations: and that I offered formulæ for the oxidation of both carbon and silicon because both elements are simultaneously and for aught I know, independently oxidized, and because I sought the proportion of oxygen removed by both.

HENRY M HOWE.

## THE DEVELOPMENT OF THE AMERICAN CHEMICAL INDUSTRY.*

By Dr. Francis Wyatt.

(*Continued from Page* 364.)

### SALT.

Common salt or chloride of sodium, is a compound coutaining chlorine (60·41 parts), and metallic sodium (39·59 parts), and is, therefore, at once the basis of the manufacture of both alkali and bleaching powder. It exists in enormous quantities in nature, and occurs either in a solid form or dissolved in water in the seas, or in the strata of all ages, from the Silurian to those actually forming at the present day. This fact is made apparent by the following table:

*Geological Ages of the Principal Deposits of Salt and Brine throughout the World.*

| | |
|---|---|
| South America | Granite and syenite. |
| Spain (Navarre) | |
| Cuaco | |
| Rio Grande | |
| Azuelo | Porphyry. |
| Puravi | Trachyte. |
| Quazeval, N. G | Mica slate. |
| Canada | Upper Silurian. |
| New York | " |
| Michigan | Carboniferous limestone to Devonian. |
| Pennsylvania | Lower coal measures. |
| Virginia | |
| Ohio | |
| Indiana | |
| Illinois | |
| Kentucky | |
| Russia | Permian. |
| England and Ireland | Triassic. |
| France and Germany | |
| Austria and Sicily | Tertiary. |

The form, however, in which salt is most widely distributed and plentiful, is sea water, as may be gathered from the following table:

COMPOSITION OF VARIOUS SEAS IN 100 PARTS.

| | $H_2O$ | Total solids. | NaCl | KCl | $CaCl_2$ | $MgCl_2$ | Bromides. | $CaSO_4$ | $MgSO_4$ | Carbonates. |
|---|---|---|---|---|---|---|---|---|---|---|
| Atlantic Ocean | 96·35 | 3·65 | 77·03 | 3·80 | ..... | 7·86 | 1·30 | 4·63 | 5·29 | 0·00 |
| Pacific Ocean | 96·70 | 3·30 | 77·35 | 3·70 | 0·05 | 7·45 | 0·85 | 3·80 | 6·70 | 0·10 |
| North Sea | 96·69 | 3·31 | 78·04 | 2·09 | 0·20 | 8·81 | 0·28 | 3·83 | 6·58 | 0·18 |
| Mediterranean Sea | 96·63 | 3·37 | 77 07 | 2·48 | ..... | 8·76 | 0·49 | 2·76 | 8·34 | 0 10 |
| Dead Sea | 77·70 | 22·30 | 36·55 | 4·57 | 11·36 | 42·20 | 0·85 | 0·45 | ..... | ..... |

The solar evaporation of sea water is, therefore, the readiest and principal source whence the industries of the Pacific Coast might derive their chief domestic supplies, although only a relatively insignificant quantity —some 35 to 40 thousand tons—are thus really annually produced in California, Utah, and the neighboring States.

The solubility of salt is proportionate to the purity of the water in which it is dissolved, and increases or diminishes *pro rata* with the quantity of foreign bodies, especially of magnesium chloride, that may happen to be present. It is hence very important when dealing with sea water to obtain highly concentrated solutions from which, owing to this peculiarity, the sodium chloride may be readily and completely deposited. To this end it is made to run very slowly through a series of shallow clay-lined pits in the soil, and allowed to evaporate under the influence of the sun until its specific gravity is 1·24.

At this stage about four fifths of the salt have become crystallized, and the remaining fluid, called the "mother liquor," is subjected to the following treatment. It will be remembered that when ammonia gas is exposed to a pressure of 6¼ atmospheres at 50 degrees it condenses to a clear liquid, which at 103 degrees Fahr. solidifies to a white, crystalline mass. In Carres apparatus this gas is generated by heating a concentrated solution of ammonia in an iron boiler, and causing it to liquefy by its own pressure in an iron receiver placed in cold water. When the boiler is removed from the fire and cooled, the liquefied ammonia evaporates very rapidly from the receiver back into the boiler, and thereby produces so much cold that a vessel of water placed in a cavity of the receiver may be at once congealed. The aforesaid mother liquor then is run off into a larger tank, mixed with about one tenth of its volume of fresh water, and being cooled to 0 degrees Fahr. by means of Carres' apparatus, undergoes a process of decomposition, in which the magnesium sulphate, acting upon some of the remaining sodium chloride, produces sulphate of soda or glaubers salts, which is crystallized out and recovered.

The liquid is now again left to evaporate until its specific gravity is 1·33, and it has deposited a fresh quantity of common salt, when, being again artificially cooled, it throws down a double salt composed of chlorides of potassium and magnesium, from which the latter chloride is extracted by washing with very little water, while the former remains behind in a sufficiently pure state for the market, and has an extensive use for agricultural purposes. Broadly speaking, and saving a few unimportant modifications, this simple, effective and economical mode of procuring salt is the one used not only in our own marine salines but in all those European countries where, as in France, Italy, Spain and Portugal, the solar evaporation of sea water is the main source of supply.

From a chemical standpoint it is strikingly illustrative of the influence exerted upon the arrangements of the various acids and bases in a saline solution, by the temperature to which that solution is exposed; the general rule being, as we see, that those salts are formed and obtained in a comparatively pure state, which are least soluble in the liquid as a given and particular temperature.

The various kinds of commercial salt derived from this practice in different countries have been found to possess the following composition:

| Where evaporated. | Impurities. | $H_2O$ | NaCl | $MgCl_2$ | $CaSO_4$ | $MgSO_4$ | Loss. |
|---|---|---|---|---|---|---|---|
| San Francisco | 0·25 | 1·00 | 97·60 | ..... | 0·70 | 0·21 | 0·24 |
| " | 0·90 | 0 86 | 95·75 | 0·16 | 0·45 | 0·05 | 1·83 |
| " | 1·10 | 0·60 | 96·00 | 0·55 | 0·62 | 0·10 | 1·03 |
| Great Salt Lake, Utah | 7·00 | 0·70 | 91·00 | 0·15 | 0·70 | 0·00 | 0·45 |
| " " " | 16·00 | 0·56 | 82·05 | 0·11 | 0·40 | 0·20 | 0·68 |
| " " " | 12·00 | 0·72 | 84·76 | 0·43 | 0·78 | 0·47 | 0·84 |
| Nevada | 1·15 | 0·47 | 96·15 | 0·35 | 0·65 | 0·30 | 0 93 |
| Noirmontiers, France | 0·58 | 7·70 | 90·17 | 0·00 | 0·71 | 0·21 | 0·63 |
| Croisic, " | 1·05 | 8·30 | 89·07 | 0·63 | 0·82 | 0·09 | 0·04 |
| Berre, " | 0·06 | 1·20 | 97·38 | 0·21 | 1·01 | 0·14 | ..... |
| Hyères, " | 0·10 | 1·83 | 97·12 | 0·14 | 0·73 | 0·04 | 0·04 |
| Portugal | 0·07 | 1·46 | 97·40 | 0·17 | 0·60 | 0·00 | 0·30 |
| Spain | 0·10 | 1·16 | 97·60 | 0·11 | 0·19 | 0·15 | 0·70 |

This table has been compiled from analyses made by the best and most modern authorities, and it demonstrates that our domestic product from this source is in no wise inferior to what is sent to us from the sames sources abroad, the impurities indicated in the Utah varieties being attributable, not to any deleterious chemical combination, but to actual dirt, originating in the sandy dust blown by the winds into the evaporating pits from the adjoining lands.

When we consider, however, that our annual consumption of salt now amounts to about 1,500,000 tons, and that only one third of this quantity is imported, it must strike us that the quota thus furnished from the ocean is unnaturally small, and that we must either be lacking in energy or in the capacity to produce as economically as our rivals, or must obtain the bulk of our requirements from still more readilly accessible, less complicated and more remunerative sources.

This, indeed, is the true aspect of the case; vast deposits of pure rock salt, and inexhaustible springs or rivers of concentrated brine, have been discovered and are being actively worked in New York, Michigan, Ohio, West Virginia, Louisiana, Indiana, Tennessee, Kentucky, Kansas, and sundry other States and Territories, and when we review the recent past it is not unwarrantable or presumptuous to assume that, in keeping with our rapid progress in other fields, we shall shortly effect so radical a change as to become sellers, and not buyers of this valuable commodity, in the markets of the world.

The first steps towards this desirable consummation have already been taken. We are pushing on quickly and surely, year by year, and, while vastly increasing our out-turn, are lessening our prime costs, and improving our quality by the application of every tested method prescribed by modern science.

Hundreds of examples might be cited to sustain this ground, but without going into so many, it will suffice if we glance at what is being accomplished in the direction alluded to in the two typical States of Michigan and New York.

(TO BE CONTINUED.)

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## MODERN AMERICAN METHODS OF COPPER SMELTING.

Mr. John Heard, Jr., the well-known mining engineer and metallurgist, manager of the Brunswick Antimony Company, in a recent letter says: Profuse and universal praise, whether applied to a book, picture, or any other creation, is apt to prejudice us against rather than in favor of the work, and I honestly admit that before reading Dr. Peters's "Modern Copper Smelting" there existed in my mind not a little doubt as to whether its merits could be commensurate with the approbation bestowed upon it. Now that I *have* read it, I will as frankly admit that no technical work has ever given me as thorough satisfaction. It is a book written by a metallurgist for metallurgists, simple, direct, and exceptionally clear. The theories asserted are well supported by direct evidence of facts; the theories doubted are always fairly stated; and where the author touches upon a point with which he does not consider himself familiar, he frankly admits his want of data or experience. When I took up this book I had just been slowly wading through the chapter on copper in Dr. Stölzel's new "*Metallurgie*," and was experiencing a recurrence of that feeling of uncertainty which in my *studentenzeit* always accompanied the study of any technical treatise written in German (Cotta's excepted), and the change was as invigorating as a brisk walk on a clear day after a few hours in the laboratory.

I can only wish that the chapter on assaying had been made a little more exhaustive. A few additional pages would have made it complete in itself and obviated the necessity of referring to the authorities quoted. It is also a fact to be regretted that the very interesting process of Bessemerizing copper mattes is not treated in greater detail; but perhaps Dr. Peters was not absolutely free to tell us all that he knew?

A few more such monographs on American metallurgical methods would go far towards convincing our former masters that their pupils have in turn become authorities whom it were wise to consult more frequently. But unfortunately for every good work that is written here, there is at once published a second to prove, no matter how unjustly, that there are many amateurs among our professionals.

**The Largest Dynamo.**—It is rumored that a dynamo is shortly to be constructed for central station electric lighting with an armature 42 feet in diameter, and an output of 3,000,000 watts.

In the whole of Germany there are at the present moment 15,000 electric arc lamps and 170,000 glow lamps in use. The required electricity is produced by more than 4000 dynamos of about 30,000 horse-power.

## FREIGHTS ON SOUTHERN PIG IRON.

The Commissioner of the Southern Railway and Steamship Association has issued the following circular, under date of November 26th, 1887:

"Herewith I hand you copy of circular No. 4, 1886, associate roads of Kentucky, Tennessee, and Alabama, showing agreed basis for pig-iron rates adopted to take effect March 4th, 1886. This basis is still in effect, except that changes have been made in the differentials used in fixing through rates to some of the points named north of the Ohio River. Present rates from Birmingham, Ala., to points named below are greater than to Louisville, as follows: Add per ton to rate to Louisville—Greencastle, Ind., $1.25; Lafayette, Ind., $1.25; Miamisburg, Ohio, $1.05; Mattoon, Ill., $1.25; Hamilton, Ohio, 95 cents; Pittsburg, Pa., $2.15; Allegheny, Pa., $2.15; Wheeling, W. Va., $2.15; Steubenville, Ohio, $2.15; Bellaire, Ohio, $2.15; Bridgeport, Ohio, $2.15; Wyandotte, Mich., $1.50.

"Ironton, O., Pekin, Ill., and Joliet, Ill., have been taken out of list of points to which through rates are published from this office. The differentials shown to be added to the rates to Louisville, in fixing through rates from Birmingham, Ala., to points north of the Ohio River, are not the rates from Louisville to points named, but they are subject to change on account of changes that may be made in the rates from Louisville or Cincinnati. Through rates from Birmingham, Ala., and Chattanooga, Tenn., are published from this office on the 20th of each month, to take effect on the 1st of the following month. The rate from Chattanooga to Memphis, Tenn., is made 25 cents per ton less than the rate from Chattanooga to Louisville, and the rate from Birmingham to Memphis is made the same as from Chattanooga to Memphis. Reports called for in the agreement should now be sent to the office of the Commissioner of the Southern Railway and Steamship Association, Atlanta, Ga. Respectfully yours,

"VIRGIL POWERS, Commissioner."

The following is the circular alluded to:

"The following basis for adjusting rates of freight on coke pig-iron, manufactured and shipped by the furnaces located at Birmingham, Alabama, and vicinity, and from Chattanooga, Tennessee, and vicinity, to points on and beyond the Ohio River, has been agreed upon, and will go into effect March 4, 1886:

"1. When the average price of No. 1 mill iron, sold by the furnaces located at and in the vicinity of Birmingham, for shipment to points on and beyond the Ohio River, is $11.25 per ton of 2268 pounds or less, the rate of freight from the furnaces to Louisville, Kentucky, shall be $2.50 per ton.

"2. When the average price of No. 1 mill iron, sold by the furnaces at and in the vicinity of Birmingham, for shipment to points on and beyond the Ohio River, exceeds $11.25 per ton, the rate of freight from such furnaces to Louisville, Kentucky, shall be increased by adding thereto 25 per cent of the increase in the price over $11.25 per ton.

"3. The rates to the points named below shall be greater than to Louisville, as follows: Add per ton to rate to Louisville, Cincinnati, Ohio, 25c.; Jeffersonville, Ind., 25c.; New Albany, Ind., 25c.; Evansville, Ind.; 25c.; St. Louis, Mo., 75c.; East St. Louis, Ill., 75c.; Bellville, Ill., 75c.; Indianapolis, Ind., 75c.; Terre Haute, Ind., 75.; Chicago, Ill., $1.50; Grand Crossing, Ill., $1.50; Pullman, Ill., $1.50; Michigan City, Ind., $1.50; Detroit, Mich., $1.50; Toledo, Ohio, $1.50; Peoria, Ill., $1.50; Cleveland, Ohio, $1.50; Sandusky, Ohio, $1.70; Zanesville, Ohio, $1.50; Columbus, Ohio, $1; Greencastle, Ind., $1; Dayton, Ohio, $1: Springfield, Ohio, $1; Lafayette, Ind., $1.50; Miamisburg, Ohio, $1.25; Ironton, Ohio, $1.25; Akron, Ohio, $1.50; South Bend, Ind., $1.50; Pekin, Ill., $1.50; Mattoon, Ill., $1.50; Mansfield, Ohio, $1.50; Newport, Ky., 25c., East Saginaw, Mich., $2.25; Newark, Ohio, $1.40; Lima, Ohio, $1.25; Hamilton, Ohio, $1; Hillsboro, Ohio, $1; Aurora, Ind., 25c.; Fort Wayne, Ind., $1.25; Joliet, Ill., $1.75; Pittsburg, Pa., $1.50.

"4. The rate of freight on pig-iron shipped from furnaces located at Chattanooga, Tenn., and fromsuch furnaces in the vicinity of Chattanooga as take Chattanooga rates, shall, to all points to which the short-line distance from Birmingham, Alabama, is through Nashville, Tennessee, Louisville, Kentucky, or Evansville, Indiana, be 25 cents per ton less, and the rate to points to which the short-line distance from Birmingham, Alabama, is through Cincinnati, Ohio, shall be 50 cents per ton less than the rates from Birmingham, Alabama, as fixed in paragraphs 1, 2 and 3.

"5. The price of No. 1 mill iron, to be used as a basis for the rate of freight, shall be arrived at in the following manner: Each of the furnace companies located at or in the vicinity of Birmingham, Alabama, shall, on the 15th day of each month, send to Mr. James R. Ogden, Commissioner Associated Roads of Kentucky, Tennessee and Alabama, No. 128 East Main street, Louisville, Kentucky, a statement of all No. 1 mill iron sold during the preceding thirty days for shipment to points on and beyond the Ohio River, showing to whom sold, destination, quantity sold, and price for which sold. If no sales shall have been made the Commissioner shall be so advised.

"6. On receipt of the statement described in the preceding paragraph, the Commissioner shall deduce the average price at which No. 1 mill iron has been sold by all the furnaces shipped to all points on and beyond the Ohio River, no allowance being made for commissions, which shall, for the purposes of this memorandum, be considered as part of the cost of producing and selling the iron.

"The price so deduced shall be made the basis for adjusting rates in accordance with paragraphs 1, 2 and 3. And the commissioner shall, on the 20th day of each month, advise all the furnaces at and in the vicinity of Birmingham, and at and in the vicinity of Chattanooga, of the rates of freight to take effect on the first day of the ensuing month, and to remain in effect until the end of the month.

"7. Should any of the furnace companies sell iron during any month for future delivery, to which they desire that rates in effect at date of sale shall apply, they shall report such sales to Mr. James R. Ogden, commissioner, giving date of sale, consignee, destination and duration of contract, stating approximately the month in which the shipments will be made, provided that the rates of freight shall not be guaranteed on sales made after more than twelve months from date of sale."

By a circular issued November 20th, 1887, the rates of freight taking effect on December 1st will be based on a rate of $3.10 from Birmingham to Louisville, Ky., per ton of 2268 pounds.

## THE NEW REICHHELM GAS-MELTING FURNACE.

Contributed to the Engineering and Mining Journal by Messrs. Torrey & Eaton.

For some time past, experiments have been in progress at the United States assay offices of Denver, Helena, and New York, having for their object the substitution of gas for coal in melting operations. In these experiments the Reichhelm furnace has been used with marked success. Dr. Munson, the energetic assayer of the Denver mint, states that the workmen would not voluntarily return to the old coal furnaces, and that "so many advantages are being developed and realized in the use of these gas furnaces, that they have not only taken the place of the old charcoal furnaces, but have caused an order for a third and larger one, equal in melting capacity to our heaviest deposits." A test of the furnace in the presence of one of the New York assay office staff proved it to be fully up to all that was expected of it. After being well heated, it melted 45 pounds of cold copper in fifteen minutes.

One of its great advantages is that it can be brought to the proper heat for melting gold in from ten to twenty minutes, and that any desired temperature can be maintained as long as may be required. Then, too, melting can be suspended and again resumed if found necessary.

Only 1000 ounce furnaces have thus far been used in Denver and Helena. Mr. Braden, of the latter office, speaks of its efficiency as four times that of the ordinary furnace.

When a pot containing metal breaks in the present furnace great trouble is caused to the melter and loss to the government, for even with the greatest care in washing the ashes, some metal goes into the sweep, which is always sold for less than the face value.

Just beneath the gas furnace there is a second pot provided, so that in case of a break the hot metal will be caught, and the melting operation only delayed for a few moments.

All the ashes from the present furnaces now go into the sweeps, but if

gas is used for fuel, not only the trouble of grinding and washing these ashes will be avoided, but the sweeps will not be diluted by them.

The entire furnace arrangement is shown in the accompanying illustration, and may be described as follows:

Three iron burners *C C* project from a mixing and distributing ring into a solid fire-brick chamber *B*, which is cup-shaped, and together with the detachable cylinder *A* forms the combustion chamber. The burners have a slanting direction sideways and downward, and serve to produce a whirl or eddy around the crucible, which is placed upon a fire-clay support in the center. The bottom part of the chamber has a hole through which any overflow is directed into a crucible *H* held against the bottom by the set screw *G*. The "bottom" *B* is secured to the burner by four bolts *E E*, which hold the iron platform *D*, and is thus easily removed and replaced by another when burned out. The injector is tangent to the distributing ring, and is so proportioned as to draw the gas, which is controlled by the valve *M*, while the air pressure is regulated by the cock *P*.

The furnace does its best work under an air pressure of 1½ pounds to the square inch. The gas supply is through a half-inch pipe, and air through one-inch pipe. A most perfect combustion is attained by the slanting direction of the flames, which rotate around the crucible instead of striking it. The furnace is practically indestructible, except as to fire-brick linings, which are easily replaced, and by the excellent provision for overflow and leakage such accidents are of little account. The objects kept in view in the construction, simplicity, durability, and economy, seem to be fully attained. An order has been issued to the Reichhelm Furnace Company for one trial furnace to be put up at the United States Assay Office here, and should the results be as satisfactory as anticipated there will soon be a demand for various sizes.

U. S. ASSAY OFFICE, NEW YORK, Nov., 1887.

## A HISTORY OF THE "SLIDING SCALE" SYSTEM OF "PROFIT SHARING" IN THE PENNSYLVNIA COAL MINES.—IV.

(*Concluded from Page* 368.)

The basis for the year 1872 was amicably arranged on January 6th, as per the following:

ARTICLES OF AGREEMENT, *made and entered into between the Anthracite Board of Trade, of the Schuylkill Region, and the Miners and Laborers' Benevolent Association, of Schuylkill County, this sixth day of January*, 1872.

*First.*—Wages to be fixed on a basis of two dollars and fifty cents ($2.50) per ton for coal at Port Carbon, with outside labor at ten dollars ($10) per week; inside labor at eleven dollars ($11) per week; miners at thirteen dollars ($13) per week; and contract work at a reduction of eight and one third (8⅓) per cent below the basis price at $2.75 last year.

*Second.*—All advance and decline to be at the rate of one (1) per cent on wages for every three (3) cents advance or decline in the price of coal, with the understanding that when coal reaches $2.75 or upward the wages shall be the same as at the same prices of coal in 1871: *Provided*, That wages shall not be less than the $2.50 basis price for more than two months out of the year, and that those two months shall be between April 1st and December 31st, and that in those two months the wages shall not be less than at a $2.25 rate.

*Third.*—Prices shall be obtained from a list of all collieries shipping over the Philadelphia & Reading Railroad over 30,000 tons in 1871 and none shall be chosen a second time until the list is exhausted. Five operators shall be chosen by lot from this list on the first day of each month (if Sunday then the day preceding) by four persons, two to be chosen by the A. B. of T. and two by the M. and L. B. A. The operators so chosen shall be required to forward to each side of the committee chosen as above on or before the tenth of the month a statement of the average of all sales of coal (excepting pea coal) for the preceding month, calculated at Fort Carbon. The committee shall meet on the tenth of the month (or if Sunday then the day preceding) and announce by circular the average obtained from the statements so presented, and the wages for the current month shall be based upon the average so obtained. For the month of January it is agreed that wages shall be paid on the $2.50 basis. Signed at Pottsville, Pa., on the sixth day of January, 1872, on behalf of the parties hereto.

*For the A. B. of T.*
WM. KENDRICK, J. L. NUTTING, J. K. SIGFRIED, GEO. W. COLE, CHAS. M. HILL, JR.

*For the M. and L. B. A.*
J. J. WILLIAMS, W. J. MCCARTY, JAS. RYAN, JR., M. FARRELL. JOHN H. DODSWORTH.

The following resolution was unanimously adopted by the above committees:

"*Whereas*, There having been some complaints about the unequal prices of powder and oil throughout the country,

"*Resolved*, That whenever difficulties occur on that question, it shall be the duty of the president of the A. B. of T. and the president of the M. and L. B. A. to investigate the matter, either in person or by deputy, and endeavor to have it amicably arranged."

The following is the table of wages for the year. As per agreement, the reduction allowed, for two months, was made in April and May:

| 1872. | Average prices of coal at Port Carbon | Scale of wages. | Wages paid per week. Miners. | Inside labor. | Outside labor. |
|---|---|---|---|---|---|
| January ... | ..... | Basis. | $13.00 | $11.00 | $10.00 |
| February .. | $2.30 3/10 | " | 13.00 | 11.00 | 10.00 |
| March ..... | 2.22 3/10 | " | 13.00 | 11.00 | 10.00 |
| April..... | 2.14 1/4 | 8¼ per cent reduction. | 11.93 | 10.09 | 9.18 |
| May. ..... | 2.01 4/10 | 8¼ " " | 11.93 | 10.09 | 9.18 |
| June. ..... | 2.07 1/2 | Basis. | 13.00 | 11.00 | 10.00 |
| July. ..... | 1.99 | " | 13.00 | 11.00 | 10.00 |
| August..... | 1.92 3/10 | " | 13.00 | 11.00 | 10.00 |
| September.. | 2.09 | " | 13.00 | 11.00 | 10.00 |
| October.. .. | 2.13 1/4 | " | 13.00 | 11.00 | 10.00 |
| November .. | 2.38 7/10 | " | 13.00 | 11.00 | 10.00 |
| December .. | 2.29 3/10 | " | 13.00 | 11.00 | 10.00 |
| Averages... | 2.14 3/10 | " | 12.82 1/6 | 10.84 5/6 | 9.86 1/3 |

The following is the agreement for basis and wages for the year 1873:

POTTSVILLE, Pa., Jan. 18, 1873.

ARTICLES OF AGREEMENT, *made and entered into this eighteenth day of January*, 1873, *between the Anthracite Board of Trade and the Miners and Laborers' Benevolent Association, for basis and wages for Schuylkill County, Pa., for the year* 1873.

*First*—Wages to be fixed on a basis of $2.50 per ton at Port Carbon, as a *minimum*. Outside labor to be ten dollars per week; inside labor to be eleven dollars per week; miners to be thirteen dollars per week, and contract work the same as for 1872. Wages on day-work to be clear of costs.

*Second*—All advances to be at the rate of one per cent for every three cents advance per ton in coal over the $2.50 average.

*Third.*—Prices shall be obtained as follows: On the first of each month (if Sunday then the day preceding), one representative of the A. B. of T. and one from the M. and L. B. A. shall meet in Pottsville, and draw, by lot, from a list of colleries shipping over 20,000 tons over the Philadelphia & Reading Railroad, five colleries, who shall report to each of the committees, on or before the 15th inst., the average prices of all coal sold, except pea, calculated at Port Carbon. The committees appointed as above shall meet on the 15th inst. (if Sunday, then the day preceding), and average the reports so made—which average shall fix the rate of wages for the current month, *provided* that wages shall not be fixed below the $2.50 basis.

*Fourth.*—The wages for January shall be on the $2.50 basis.

*For A. B. of T.*
WM. KENDRICK, T. GARRETSON, GEO. W. COLE, J. K. SIGFRIED. DANIEL R. MILLER,

*For M. and L. B. A.*
JOHN SINEY, JAS. E. BRENNAN, MARTIN LAWLER, WM. MAPSTONE, THOS. W. TAYLOR.

The wages paid under this arrangement were as follows:

| 1873. | Average prices of coal at Port Carbon. | Scale of wages. | Wages paid per week. Miners. | Inside labor. | Outside labor. |
|---|---|---|---|---|---|
| Jan..... | | Basis. | $13.00 | $11.00 | $10.00 |
| Feb..... | $2.63 4/10 | 4 per cent advanec. | 13.52 | 11.44 | 10.40 |
| March.... | 2.62 4/10 | " " | 13.52 | 11.44 | 10.40 |
| April..... | 2.49 27/100 | Basis. | 13.00 | 11.00 | 10.00 |
| May..... | 2.51 | " | 13.00 | 11.00 | 10.00 |
| June. .... | 2.50 73/100 | " | 13.00 | 11.00 | 10.00 |
| July..... | 2.55 4/100 | 2 per cent advance. | 13.26 | 11.22 | 10.20 |
| Aug..... | 2.60 49/100 | 3 " " | 13.39 | 11.33 | 10.30 |
| Sept. .... | 2.60 94/100 | 4 " " | 13.52 | 11.44 | 10.40 |
| Oct . .... | 2.62 | 4 " " | 13.52 | 11.44 | 10.40 |
| Nov.. .... | 2.65 66/100 | 5 " " | 13.65 | 11 55 | 10.50 |
| Dec..... | 2.74 22/100 | 8 " " | 14.04 | 11.88 | 10.80 |
| Averages. | 2.59 58/100 | | 13.36 3/10 | 11.31 7/10 | 10.28 3/10 |

*Agreement for Basis for* 1874.

The agreement, made and concluded at Pottsville this twenty-fourth day of January, 1874, between the operators of the Schuylkill Region and the Miners and Laborers' Benevolent Association, by their committees, for the basis for wages to be paid the workmen in the Schuylkill Region for the year ending December 31st, 1874.

*Witnesseth:* The wages to be fixed upon a basis of $2.50 per ton at Port Carbon as a minimum.

The wages are to be—outside labor, ten (10) dollars per week; inside labor, eleven (11) dollars per week; miners working by the day, thirteen (13) dollars per week, and contract or yard work to be the same rates as paid in 1873. The wages for day work to be clear of all cost.

All advances are to be at the rate of one per cent for every three (3) cents advance in the price of coal above $2.50 per ton average at Port Carbon.

The prices of coal for fixing wages shall be obtained as follows: On the first day of each and every month (if the first day should fall upon a Sunday, then the preceding day) a committee consisting of one representative of the operators and one of the Miners and Laborers' Benevolent Association, shall meet in Pottsville and draw by lot from a list of collieries shipping over twenty thousand (20,000) tons per annum, over the Philadelphia & Reading Railroad, five (5) collieries who shall report to each of the committee on or before the 15th day of each and every month (if the 15th day should fall upon a Sunday, then the preceding day) the average of prices obtained for all coal sold by them, excepting pea coal, calculating the same at Port Carbon. The committee appointed as above shall meet on the 15th and average the prices so reported, which average shall fix the rate of wages for the current month.

M. & L. B. A.,
JOHN SINEY,
JEREMIAH CURRAN,
F. J. FITZGERALD,
WILLIAM MORGAN,
his
ROBERT X THOMAS,
mark.

Operators,
GEORGE W. COLE,
WILLIAM BRENIZER,
DANIEL R. MILLER,
GEORGE H. JOHNS,
T. GARRETSON.

Witnesses at signing of all:
B. E. TROUTMAN,
W. S. THOMAS.

The wages computed in accordance with this agreement are given in the following table:

| 1874. | Average prices of coal at Port Carbon | Scale of wages. | Wages paid per week. Miners. | Inside labor. | Outside labor. |
|---|---|---|---|---|---|
| January ... | $2.70 7/10 | 7 per cent. advance. | $13.91 | $11.77 | $10.70 |
| February... | 2.75 18/100 | 9 " " | 14.17 | 11.99 | 10.90 |
| March..... | 2.66 98/100 | 6 " " | 13.78 | 11.66 | 10.66 |
| April..... | 2.38 | Basis. | 13.00 | 11.00 | 10.00 |
| May .... .. | 2.44 88/100 | Basis. | 13.00 | 11.00 | 10.00 |
| June ..... | 2.49 96/100 | Basis. | 13.00 | 11.00 | 10.00 |
| July ..... | 2.54 1/10 | 1 per cent. advance. | 13.13 | 11.11 | 10.10 |
| August..... | 2.54 17/100 | 1 " " | 13.13 | 11.11 | 10.10 |
| September . | 2.65 39/100 | 5 " " | 13.65 | 11.55 | 10.50 |
| October ... | 2.60 1/10 | 3 " " | 13.39 | 11.33 | 10.30 |
| November.. | 2.76 8/10 | 9 " " | 14.17 | 11.99 | 10.90 |
| December .. | 2.63 | 4 " " | 13.52 | 11.44 | 10.40 |
| Averages .. | 2.60 | | 13.48 5/10 | 11.41 3/10 | 10.38 |

No agreement was made with the men for 1875, nor for 1876, but the following rates of wages were fixed by the Schuylkill Coal Exchange, and accepted by the men after a strike lasting from January to the middle of June, 1875.

PHILADELPHIA, Dec. 31, 1874.

Rates of wages for 1875, adopted by the Executive Committee of the Schuylkill Coal Exchange:

Outside Wages.—First-class wages, $1.50 per day; second-class wages, $1.35 per day.

All other outside labor to be reduced ten per cent., and all outside labor to be *specific—i. e.*, not upon a basis, and with no *sliding scale*.

All inside work to be on basis system. Basis, $2.50 for coal at Port Carbon. *Only white ash collieries to be drawn.*

Inside labor and miners' wages to be reduced ten per cent from present basis prices. Contract work to be reduced *twenty per cent.* One per cent on inside work to be paid for every three cents advance in the price of coal at Port Carbon above $2.50, and one per cent to be deducted for every decrease of three cents below $2.50.

No maximum or no minimum.

ALBERT B. ECKEL, Secretary.

This would place miners' wages at $11.70 and inside labor at $9.90 when coal brought $2.50 at Port Carbon.

The inside wages paid under this arrangement during 1875 and continued up to the present time, are given in the following table:

| | Jan. | Feb. | Mar. | Apr. | May. | June | July. | Aug. | Sept. | Oct. | Nov. | Dec. | Av. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1875.** | | | | | | | | | | | | | |
| A. | ..... | ..... | ..... | ..... | ..... | 2.59 | 2.59 | 2.55 | 2.57 | 2.56 | 2.67 | 2.70 | $2.61 |
| C %. | ..... | ..... | ..... | ..... | ..... | +3 | +3 | +2 | +2 | +2 | +6 | +6 | ..... |
| D. | ..... | ..... | ..... | ..... | ..... | 12.05 | 12.05 | 11.93 | 11.93 | 11.93 | 12.40 | 12.40 | 12.09 |
| E. | ..... | ..... | ..... | ..... | ..... | 10.20 | 10.10 | 10 10 | 10.10 | 10.10 | 10.49 | 10.49 | 10.24 |
| **1876.** | | | | | | | | | | | | | |
| A. | 2.53 | 2.57 | 2.43 | 2.48 | 2.30 | 2.43 | 2.37 | 2.47 | 1.93 | 1.87 | 1.81 | 1.75 | 2.25 |
| B % | +1 | +1 | −2 | −1 | −7 | −2 | −4 | −1 | −19 | −21 | −23 | −25 | ..... |
| C %. | +1 | +2 | −2 | −1 | −7 | −2 | −4 | −1 | −19 | −21 | −23 | −25 | ..... |
| D. | 11.82 | 11.93 | 11.46 | 11.58 | 10.88 | 11.46 | 11.22 | 11.58 | 9.48 | 9 24 | 9.00 | 8.78 | 10.70 |
| E. | 10.00 | 10.10 | 9.70 | 9.80 | 9.20 | 9.70 | 9.50 | 9.80 | 8.00 | 7.83 | 7.63 | 7.42 | 9 50 |
| **1877.** | | | | | | | | | | | | | |
| A. | 1.70 | 1.83 | 1.79 | 1.74 | 1.63 | 1.50 | 1.39 | 1.64 | 1.76 | 1.67 | 1.56 | 1 55 | 1.65 |
| B %. | −27 | −22 | −23 | −25 | −29 | −33 | −37 | −28⅜ | −25 | −28 | − 31 | −32 | ..... |
| C %. | −27 | −22 | −23 | −25 | −29 | −30 | −30 | −20 | −20 | −20 | − 30 | −25 | ..... |
| D. | 8.55 | 9.13 | 9.00 | 8.78 | 8.36 | 8 19 | 8.19 | 9 36 | 9.36 | 9.36 | 8.19 | 8.78 | 8.80 |
| E. | 7.23 | 7.73 | 7.63 | 7.42 | 7.03 | 6.93 | 6.93 | 7.92 | 7.92 | 7.92 | 6.93 | 7.42 | 7.46 |
| **1878.** | | | | | | | | | | | | | |
| A. | 1.83 | 2.02 | 1.87 | 1.95 | 1.96 | 1.90 | 1.90 | 1.94 | 1.93 | 2.08 | 2.10 | 1.94 | 1.96 |
| B %. | −22⅛ | −16 | −21 | −19 | −18 | −20 | −20 | −19 | −19 | −14 | −13 | −19 | ..... |
| C %. | −20 | −16 | −20 | −16 | −16 | −16 | −10 | −10 | −10 | −10 | −10 | −10 | ..... |
| D. | 9.36 | 9.83 | 9.36 | 9.83 | 9 83 | 9 83 | 10.53 | 10 53 | 10.53 | 10 53 | 10.53 | 10.53 | 10.11 |
| E. | 7.92 | 8.32 | 7.92 | 8.32 | 8.32 | 8.32 | 8.90 | 8 90 | 8.90 | 8.90 | 8.90 | 8 90 | 8.55 |
| **1879.** | | | | | | | | | | | | | |
| A. | 1.77 | 1.77 | 1 73 | 1.66 | 1.66 | 1 68 | 1.65 | 1.66 | 1.70 | 1 79 | 2.05 | 2.10 | 1.78 |
| B %. | −24 | −24 | −25 | −28 | −28 | −27 | −28 | −28 | −27 | −24 | −15 | −10 | ..... |
| C %. | −20 | −20 | −20 | −20 | −20 | −16 | −16 | −12 | −12 | −12 | −8 | −8 | ..... |
| D. | 9.36 | 9.36 | 9.36 | 9.36 | 9.36 | 9.83 | 9.83 | 10 30 | 10 30 | 10.30 | 10.76 | 10.76 | 9 90 |
| E. | 7.92 | 7.92 | 7.92 | 7.92 | 7.92 | 8 32 | 8.32 | 8.72 | 8.72 | 8.72 | 9.11 | 9.11 | 8.39 |
| **1880.** | | | | | | | | | | | | | |
| A. | 2.35 | 2.27 | 2.46 | 2.47 | 2.46 | 2.49 | 2.47 | 2.49 | 2 51 | 2.50 | 2.49 | 2.49 | 2.45 |
| B %. | −5 | −8 | −1 | −1 | −1 | −2 | −1 | Basis | Basis | Basis | Basis | Basis | ..... |
| C %. | −4 | −4 | −1 | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | ..... |
| D. | 11.22 | 11.22 | 11 58 | 11.70 | 11.70 | 11 70 | 11.70 | 11.70 | 11.70 | 11.70 | 11 70 | 11.70 | 11.61 |
| E. | 9.51 | 9.51 | 9 80 | 9.90 | 9.90 | 9.90 | 9.90 | 9 90 | 9.90 | 9 90 | 9.90 | 9.90 | 9 82 |
| **1881.** | | | | | | | | | | | | | |
| A. | 2.53 | 2.55 | 2.43 | 2.41 | 2.32 | 2.42 | 2.41 | 2.41 | 2.40 | 2.41 | 2.40 | 2.47 | 2.43 |
| B %. | +1 | +2 | −2 | −3 | −6 | −3 | −3 | −3 | −3 | −3 | −3 | −1 | ..... |
| C %. | +1 | +2 | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | ..... |
| D. | 11.82 | 11 93 | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 | 11 70 | 11.70 | 11 70 | 11.70 | 11.73 |
| E. | 10 00 | 10.10 | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9 90 | 9.90 | 9 90 | 9.90 | 9.93 |
| **1882.** | | | | | | | | | | | | | |
| A. | 2.42 | 2.43 | 2.46 | 2.44 | 2.40 | 2.42 | 2.45 | 2.44 | 2.45 | 2.48 | 2.49 | 2.47 | 2 45 |
| B %. | −2 | −2 | −1 | −2 | −3 | −3 | −2 | −2 | −2 | −1 | Basis | −1 | ..... |
| C %. | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis |
| D. | 11.70 | 11.70 | 11.70 | 11 70 | 11.70 | 11 70 | 11.70 | 11.70 | 11 70 | 11.70 | 11 70 | 11.70 | 11.70 |
| E. | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9 90 | 9.90 | 9 90 | 9.90 | 9 90 | 9.90 | 9.90 | 9.90 |
| **1883.** | | | | | | | | | | | | | |
| A. | 2.46 | 2.47 | 2.49 | 2.40 | 2.42 | 2.43 | 2.48 | 2.47 | 2.49 | 2.49 | 2 50 | 2.49 | 2.47 |
| B %. | −1 | −1 | Basis | −3 | −3 | −2 | −1 | −1 | Basis | Basis | Basis | Basis | ..... |
| C % | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | ..... |
| D. | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 | 11 70 | 11.70 | 11.70 | 11 70 | 11.70 | 11 70 | 11.70 | 11.70 |
| E. | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 |
| **1884.** | | | | | | | | | | | | | |
| A. | 2.49 | 2.47 | 2.47 | 2.45 | 2.45 | 2.46 | 2.40 | 2.45 | 2.47 | 2.43 | 2.42 | 2.28 | 2.45 |
| B %. | Basis | −1 | −1 | −2 | −2 | −1 | −1 | −2 | −1 | −2 | −3 | −7 | ..... |
| C %. | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | ..... |
| D. | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 |
| E. | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 |
| **1885.** | | | | | | | | | | | | | |
| A. | 2.19 | 2.22 | 2.31 | 2.40 | 2.39 | 2.42 | 2.37 | 2.39 | 2.44 | 2.41 | 2.48 | 2.36 | 2.36 |
| B %. | −1 | −9 | −6 | −3 | −4 | −2 | −4 | −4 | −2 | −3 | Basis | −5 | ..... |
| C % | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | ..... |
| D. | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 |
| E. | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9 90 | 9.90 | 9.90 | 9.90 | 9.90 | 9 90 |
| **1886.** | | | | | | | | | | | | | |
| A. | 2.37 | 2.35 | 2.33 | 2.32 | 2.29 | 2.41 | 2.34 | 2.33 | 2.39 | 2.52 | 2.52 | 2 54 | 2.40 |
| B %. | −4 | −5 | −6 | −6 | −7 | −3 | −5 | −6 | −4 | +1 | +1 | +1 | ..... |
| C %. | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | Basis | +1 | +1 | +1 | ..... |
| D. | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 | 11.70 | 11 82 | 11 82 | 11.82 | 11.73 |
| E. | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 9.90 | 10 00 | 10.00 | 10.00 | 9.92 |
| **1887.** | | | | | | | | | | | | | |
| A. | 2 51 | 2.51 | 2.55 | 2.59 | 2.51 | 2.60 | 2.51 | 2 48 | 2.45 | ..... | ..... | ..... | ..... |
| B %. | Basis | Basis | +2 | +3 | Basis | +4 | Basis | Basis | ..... | ..... | ..... | ..... | ..... |
| C %. | Basis | Basis | +2 | +3 | +3 | +4 | +4 | +4 | +4 | +8 | +8 | +8 | ..... |
| D. | 11.70 | 11.70 | 11.93 | 12.05 | 12.05 | 12.17 | 12.17 | 12.17 | 12.17 | 12 65 | 12.65 | 12.65 | 12.21 |
| E. | 9.90 | 9.90 | 10.10 | 10.20 | 10.20 | 10.30 | 10.30 | 10.30 | 10.70 | 10.70 | 10.70 | 10.70 | 10.33 |

A. Prices of coal at Port Carbon.
B. Percentage that prices were above +, or below −, basis.
C. Percentage above +, or below − basis actually paid.
D. Miners' wages per week.
E. Inside laborers' wages per week.

The following table embodies a summary of the average wages paid under the basis system in the Schuylkill coal region from its establishment in 1869:

| YEARS. | Av. prices of coal at Pt. Carbon. | Average wages paid per week. | | |
|---|---|---|---|---|
| | | Miners. | Inside labor. | Outside labor. |
| 1869 | $3.20 | $15.70 | $13.46 | $12.33½ |
| 1870 | 2.45 | 11.46⅛ | 9.82½ | 9.00⅜ |
| 1871 | 2.61 | 12.70¾ | 10.75¼ | 9.77¾ |
| 1872 | 2.14 | 12.82⅛ | 10.84⅜ | 9.86⅛ |
| 1873 | 2.60 | 13.34 7/10 | 11.29 3/10 | 10.26 7/10 |
| 1874 | 2.60 | 13.48 8/10 | 11.41 3/10 | 10.38 |
| 1875 | 2.61 | 12.09 9/10 | 10.24 | * |
| 1876 | 2.25 | 10.70 | 9.50 | * |
| 1877 | 1.65 | 8.60 | 7.46 | * |
| 1878 | 1.96 | 10.11 | 8.55 | * |
| 1879 | 1.78 | 9.90 | 8.39 | * |
| 1880 | 2.45 | 11.61 | 9.82 | * |
| 1881 | 2.43 | 11.73 | 9 93 | * |
| 1882 | 2.45 | 11.70 | 9.90 | * |
| 1883 | 2.47 | 11.70 | 9.90 | * |
| 1884 | 2.45 | 11.70 | 9.90 | * |
| 1885 | 2.36 | 11.70 | 9.90 | * |
| 1886 | 2.40 | 11.73 | 9.92 | * |
| 1887 | 2.52 | 12.21 | 10.33 | * |

* First-class wages, $1.50 per day = $9 per week; second-class wages, $1.35 per day = $8.10 per week.

The men were idle:

In 1869, from May 10th to the middle of June.

In 18870, from the beginning of the year until August 1st, with partial resumptions from January 17th to April 2d.

In 1871, from January 10th until the middle of May.

In 1875, from the beginning of the year until the middle of June.

The foregoing details and tables have been derived from official sources, and are believed to represent actual wages paid, although the columns headed "scale of wages," upon which the calculations are based, do not, in all cases, conform strictly to the letter of the agreements—that for 1869 being notably erratic. Indeed, the table for that year is prepared in utter disregard of the agreement, which, however, was so phrased as to render compliance with its provisions impossible upon any common standard, and in the case of any colliery where the *amount* of coal shipped each month is unknown. With the exception of the scale of wages for August, 1870, there is apparently no other variation exceeding one per cent. Ordinarily fifty cents per week was added to the wages of men in the tables for miners and inside laborers, to cover the cost of oil, etc., which was then charged to the men.

## COAL MINING IN ILLINOIS IN 1886-7.

The State Board of Labor Statistics of Illinois have issued an advance statement of their report on the mining operations of the State for the year ended July 1st last, from which the following information is taken:

The coal output of the year was 10,278,890 tons, being fully 1,000,000 tons in excess of the preceding year, and considerably the largest in the mining history of the State, while the indications are favorable to a still larger output for the year now current. The miners also realized about 5 cents a ton above the prices of the previous year. Still the average prices of coal at the mines have declined shortly, being now $1·085 a ton, against $1.111 the year before. The number of mine operators has increased, and the period of active operations was 213·2 days, against 206 days the preceding year. The operations of the year have been remarkably free from interruptions by strikes, the prolonged Grape Creek strike was unsettled at the end of a year and a half of its existence. Relative to the effects of the long continued drouth upon the mining operations, the report says:

"In some parts of Madison, Macoupin and St. Clair counties, and even as far north as Minonk, in Woodford County, water has been so scarce that many operators have been obliged to transport by rail the entire supply for their boilers. Even reservoirs for the accumulation of surface water which had formerly afforded an abundant supply have become exhausted, and in some instances new and larger ones have been excavated as permanent features of the mine equipment. Many wells have been sunk at other places with but indifferent success.

The statistical summary of the year's operations is shown as follows:

| | |
|---|---|
| Number of counties reported | 49 |
| Number of mines and openings of all kinds | 817 |
| Number of tons of coal mined | 10,278,890 |
| Aggregate value of the same at mines | $11,152 596 |
| Average value per ton at the mines | $1.085 |
| Number of employés of all kinds | 26,804 |
| Average number of days of active operations | 213·2 |
| Average price per ton paid for mining | $0.727 |
| Number of kegs of powder used | 152,627 |
| Number of mules employed underground | 1,474 |
| Number of men killed | 41 |
| Number of men injured so as to lose time | 180 |
| Number of tons mined for each life lost | 244,735 |
| Number of employés for each life lost | 409 |

The number of producing mines has steadily increased since 1883, when it was 639, to 817 now. Of mines producing 50,000 tons or more during the year there are only 64. Of the total output of the year the Consolidated Coal Company, of St. Louis, which owns 71 mines in the State, furnished 2,008,341, the outcome of only ten months' operations. The Chicago, Wilmington & Vermillion Coal Company operates four mines at Braidwood and three at Streator, and produced 851,308 tons. The Spring Valley Coal Company, near La Salle, made an output of 351,985 tons from three mines. These are the largest producers in the State. Next to them are the Wilmington Star Coal Company, 115,645 tons; the La Salle County Carbon Coal Company, 107,250 tons; the Sangamon Coal Company, of Springfield, 140,182 tons. The total output of the Illinois mines for the last seven years has been 64,680,225 tons.

The coal operators are now receiving from one quarter to one third less for their product than they were in 1882. Since that year, in fact when the price at the mine averaged $1.51 for the State, there has been a steady decline, the variation being slighter last year than in former years. This latter fact and the fact that the wages of miners have slightly improved are adduced as good reasons for thinking that the limit of depression in Illinois coal operations has been reached. The average price of mining is now 66 per cent of the average value at the mines. Five years ago it was only 54 per cent. Estimating the average price for mining at 72·7 cents per ton for the State the gross sum paid out for producing 10,278,890 tons last year was $7,472,753. The total value of the output at the mines ($1.085 a ton) was $11,152,596, leaving $3,679,843, or 35·8 cents a ton, as the margin to cover the interest on investment, expenses, hazards of the business, and profits. The counties which produced the most coal were:

| | Tons. | | Tons. |
|---|---|---|---|
| St. Clair | 915,827 | Vermillion | 345,464 |
| Sangamon | 730,391 | Livingston | 357,600 |
| Madison | 460,926 | Fulton | 304,588 |
| La Salle | 657,296 | Jackson | 311,279 |
| Peoria | 434,900 | Perry | 319,532 |
| Macoupin | 914,894 | | |

There are in fact only 292 mines in the State engaged in the coal-shipping trade, the remaining 516 being in the local trade.

**Explosives in the German Coal Mines.**—The Superior Mining Department of Dortmund has ordered only roburit and carbonit to be used for blasting purposes in the coal mines which come within its sphere of jurisdiction.

**The Orange Diamond.**—The great Orange diamond which was found at the Cape of Good Hope, and which is ten carats heavier than the famous stone known as the Koh-i-noor, now in the possession of Queen Victoria, was offered for sale by auction in London, England, December 1st, but was withdrawn, there being no bidders.

**What is Iron Ore in Law?**—In the absence of any thing showing the contrary a grant of the right to mine and carry away iron ore must be held to apply only to such ore as can be employed in the manufacture of iron as ordinarily carried on, and does not necessarily include all substances containing iron and capable of being made to yield that metal, but only such as are commonly used for that purpose. So held by the Supreme Court of Pennsylvania in Erwin's appeal, reported in the Philadelphia *Legal Intelligencer*. In this case the court held that an earth containing a percentage of iron too small to be profitably smelted and suitable only for making paint did not come within the terms of the agreement.

**The Bell Telephone Patent Cancelled in Austria.**—The efforts of the Telephone Company of Austria to get the Bell patent cancelled have at last been successful. Their manager, Mr. R. Howard Krause, believed this possible from the commencement, and with the assistance of Mr. Otto Schaffler, the company has been the means of securing free trade in telephones in Austria. The result of the decision of the Austrian Ministry of Commerce, and the Hungarian Ministry of Agriculture, Industry and Trade, dated October 28th, 1887, seems to be that all those clauses of Bell's patent which refer to the telephone are cancelled, only those referring to the multiplex telegraphy being allowed to stand. Certain clauses were cancelled because the Telephone Company of Austria was able to prove prior publication, and others were cancelled because the company proved that they embodied scientific principles which, according to Austrian law, can not be the proper subject of a patent.

**New Use for Dynamite.**—*Nature* describes a new way of utilizing this explosive, lately devised by Mr. Bonnetond, a French military engineer, who uses the expansive force to drive out, for a brief period, the water from portions of wet ground in which foundations are to be made. The method is now in practice in the construction of a fortified *enceinte* at Lyons. A hole is first bored 10 feet or 12 feet deep, and about 1½ inch wide, in the wet ground. Into this is passed a string or cartridges of dynamite, which is then exploded. The water is thus driven far out beyond the sides of the cavity, over a yard wide, which is produced, and it does not reappear till after half an hour at least. The workmen thus have time to clear the cavity and introduce quickly-setting concrete. When the water returns it can not injure the foundation. A rapid rate of progress is realized by this method.

**Value of the Engineering and Mining Journal.**—As a proof of the esteem in which the ENGINEERING AND MINING JOURNAL is held by its foreign subscribers, a distinguished English metallurgist writes to us from North Wales: "I am sorry to have to own to you that we have no such journal as yours over here, devoted to mining and metallurgy. Our engineering papers are first-class, but in mining and metallurgy we have nothing—or less. Of course you know all this. I only wish we could beat it on this side."

Another well known engineer, who lives in one of our western States, writes: "It is now nearly ten years since I began to send letters to the ENGINEERING AND MINING JOURNAL, which I continued for three or four years. I was then persuaded that it would pay us better here were I to write for home papers, such as the ——— ——— (one of the best and most influential papers in the Western States). This I did, writing them a series of letters which I afterwards brought out in pamphlet form. But they have not done us one-hundredth part of the good my letters in the ENGINEERING AND MINING JOURNAL did, nor have they done me as much good personally, and I am anxious to return to the ENGINEERING AND MINING JOURNAL fold."

**Incandescent Gas Lights.**—At the time of the Crystal Palace Electric and Gas Exhibition in 1882–83, the Clamond incandescent gas light was described. Since that date, *Engineering* says, very little has been heard of it in England until the last few months. It now appears in a new and much improved form—one which permits of it being used under the usual conditions of gas supply. The compressed air jet, formerly used to obtain a flame of sufficient intensity to cause the filaments of magnesia to glow, is now abolished, and a similar effect is gained by the use of a long glass chimney. The gas emerges from a ring of holes in a burner of the argand type, but the holes, instead of being on the top of the ring, are on the inside. Through the center of this ring there is a powerful draught which blows out the flame and raises its temperature after the manner of a blow-pipe jet. The flame passes into the center of a basket-like cone of magnesia, about 1 inch in diameter at the bottom and 1⅝ inches high. This cone, which is raised to a glowing heat by the flame, which plays inside it and passes through its interstices, emits a rich light about the same color as that from a good argand burner. It is stated that with a consumption of 6 feet of gas per hour a light of 32 candle-power is obtained. The cones will last, it is stated, for 200 hours burning, and are sufficiently rigid to permit of them being handled without special care.

**Fire-Bricks and their Constitution.**—Mr. W. F. Dent, in the course of his lectures to the Society of Arts in London, on the subject of building materials, said that plastic clays consist of silica and alumina chemically combined with water, and depending upon that water for their plastic properties. The proportion of water which is mechanically combined with the clay can be expelled from it by exposure to a temperature a little above boiling, without detriment to its plasticity; but its water of combination can not be driven off without raising the temperature to at least a dull red. Silica, alumina, and lime are all very infusible substances separately, and are capable of withstanding very high temperatures without softening. In the case of pure lime this is shown by its behavior when exposed to the flame of an oxyhydrogen blow-pipe for producing a brilliant light. From its want of cohesion, however, it could never be brought into general use for the purposes for which fire-bricks are required; and the same may be said of silica, which needs the addition of some substance of a basic character, with which it will bind into a coherent bulk. The nearest approach to the use of silica alone as a fire-brick is in the case of the well-known Dinas bricks, which are made from a native rock cropping out in the Vale of Neath. This material expands under heat. In order to make bricks of the granulated Dinas rock, about 1 per cent. of lime is added to it. These bricks will stand very high temperatures, but are more friable than ordinary fire-bricks, and will not resist to the same extent the action of basic substances, and particularly of slags containing much oxide of iron. Being very porous, also, furnaces lined with Dinas bricks must be slowly dried. The composition of the clay used for fire-bricks is a question of considerable importance, inasmuch as its quality depends greatly upon its chemical constitution, although its power of resisting fusion when exposed to intense heat is affected by its mechanical condition—being more refractory when coarsely ground.

## BOOKS RECEIVED.

**[In sending books for notice, will publishers, for their own sake and for that of book buyers, give the retail price? These notices do not supersede review in another part of the Journal.]**

*Mechanics of Materials. A Treatise on the Elasticity and Strength of Beams, Columns, etc.* By Irving P. Church, C.E., Assistant Professor of Civil Engineering, Cornell University, Ithaca, N. Y. Published by John Wiley & Sons. New York. 1887. Pages 514, and Index. Illustrated. Price, $3.

## DIVIDENDS PAID BY MINING COMPANIES DURING NOVEMBER AND FROM JANUARY 1st, 1887.

| NAME OF COMPANY. | Paid in Nov. | Since Jan. 1. | NAME OF COMPANY. | Paid in Nov. | Since Jan. 1 |
|---|---|---|---|---|---|
| Adams, Colo | ..... | $15,000 | Jumbo, Colo. | ..... | $35,000 |
| Amy & Silversmith, Mont | ..... | 42,675 | Lady Franklin, N. M. | ..... | 50,000 |
| Aurora, Mich | ..... | 155,000 | Leadville Cons., Colo. | ..... | 20,000 |
| Atlantic, Mich | ..... | 40,000 | Mammoth, Utah | 10,000 | 20,000 |
| Bellevue Idaho, Idaho | ..... | 37,500 | Mary Murphy, Colo. | ..... | 70,000 |
| Big Bend Hydraulic Dak | ..... | 48,000 | Montana, Lim., Mont. | ..... | 699,800 |
| Brooklyn Lead, Utah | ..... | 25,000 | Morning Star, Colo. | 25,000 | 50,000 |
| Buxton, Dak | 5,000 | 5,000 | Moulton, Mont | ..... | 30,000 |
| Calumet & Hecla, Mich. | ..... | 1,000,000 | Mount Pleasant, Cal. | ..... | 45,000 |
| Central, Mich | ..... | 40,000 | Mugwump, Dak | ..... | 4,000 |
| Cons. Cal. & Va., Nev. | ..... | 1,080,000 | Ontario, Utah | 75,000 | 825,000 |
| Colorado Central, Colo. | ..... | 68,750 | Original, Mont. | ..... | 9,000 |
| Daly, Utah | 75,000 | 375,000 | Osceola, Mich. | ..... | 50,000 |
| Deadwood Terra, Dak. | 20,000 | 100,000 | Paradise Valley, Nev. | ..... | 10,000 |
| Derbec Blue Gravel, Cal. | ..... | 20,000 | Parrott, Mont | ..... | 54,000 |
| Dunkin, Colo | ..... | 30,000 | Plymouth Cons., Cal. | 40,000 | 335,000 |
| Eclipse | 10,000 | 10,000 | Plumas Eureka, Cal. | ..... | 42,590 |
| Elkhorn, Mont | ..... | 85,000 | Quicksilver, Cal. | ..... | 118,250 |
| Empire, Mont | ..... | 70,500 | Quincy, Mich | ..... | 200,000 |
| Eureka, Nev | 12,500 | 37,500 | Richmond Con., Nev. | ..... | 67,500 |
| Garfield, Nev | ..... | 12,500 | Russell, Cal. | 5,000 | 30,000 |
| Granite Mountain, Mont | 200,000 | 1,800,000 | Silver King, Ariz. | ..... | 175,000 |
| Gypsy Queen, N. M. | 2,000 | 4,000 | Sierra Buttes, Cal. | ..... | 76,256 |
| Homestake, Dak | 25,000 | 275,000 | Small Hopes, Colo. | 50,000 | 550,000 |
| Honorine, Utah | ..... | 37,500 | Standard, Cal. | 5,000 | 10,000 |
| Hope, Mont | ..... | 25,000 | St. Joseph's Lead, Mo | ..... | 60,000 |
| Illinois, New Mex | ..... | 25,000 | Surinam, D. G. | 30,000 | 105,000 |
| Iron Hill, Dak | ..... | 43,750 | Viola, Limited, Idaho | ..... | 37,500 |
| Iron Silver, Colo. | ..... | 300,000 | Yankee Girl, Colo. | ..... | 187,500 |
| Idaho, Cal. | 15,500 | 139,500 | | | |
| Jay Gould, Mont | ..... | 71,000 | Total | 623,750 | 9,914,574 |

## PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent-Office.

PATENTS GRANTED NOVEMBER 29TH, 1887.

373,817. Crushing and Pulverizing Mill. Francis M. Davis, Denver, Colo.
373,830. Lubricator for Drilling Machines. Chas. J. Herroerg, Columbus, O., Assignor to the Newark Machine Company, same place.
373,847. Machine for Stretching Belting. Geo. F. Page, Concord, N. H.
373,848. Valve. Howard D. Pearsall, London, Eng.
373,855. Device for Truing Metal Castings. Henry Rung, Rochester, Assignor to Helen M. Kirkpatrick, Macedon, N. Y.
373,859. Regulator for Electric Generators. Robert P. Sellon and William M. Mordey, Victoria Works, Belvedere Road, County of Surrey, Assignors of one third to Charles E. Webber, Victoria Works, England.
373,880. Steam-Engine and Shaft-Hanger. Joel T. Case, Bristol, Assignor to the J. T. Case Engine Company, New Britain, Conn.
373,883. Application of Accumulators to Electric Lighting. Thomas P. Conant, Brooklyn, N. Y., Assignor to the Electrical Accumulater Company, of New York.
373,894. Steam Rock-Drill. Geo W. Jones, Cleveland, Ohio.
373,908. Reamer for Boring Gas, Oil, or Water-Wells. John M. Ross, Bower Hill, Pa.
373,922. Steam or Water-Motor. Joel T. Case, Bristol, Assignor to the J. T. Case Engine Company, New Britain, Conn.
373,923. Piston Gas-Meter. August C. Christensen, Brooklyn, N. Y.
373,926. Boiler Tube-Cleaner. Herbert L. Currier, Lynn, Mass., Assignor to Frank B. Graves, same place.
373,936. Piston for Steam Engines. Alexander MacLaine, Queens Elms, Belfast, County of Antrim, Ireland.
373,946. Means for Protecting the Walls of Buildings or Other Structures. George Richardson, New York.
373,955. Hydrocarbon Furnace. Lewis B. White, New York, Assignor to Leon Abbett, Jersey City, N. J.
373,996. Machine for Finishing Horseshoe Nails. William W. Miner, New Haven, Conn., Assignor to the New Haven Nail Company, same place.
374,056. Gas-Engine. Chas. J. B. Gaume, Brooklyn, N. Y., Assignor to the Continental Gas-Engine Company, New York.
374,057. Liquid Fuel Furnace. Chas. M. Gearing, Pittsburg, Pa.
374,058. Regenerative Gas-Burner. Thomas Gordon, Philadelphia, Pa., Assignor to the Siemens Lungren Company, of Pennsylvania.
374,065. Machine for Molding Emery or Other Plastic Wheels. Chas. Heaton, Bainbridge, N. Y.
374,073. Valve for Motors. Emil Kaselowsky, Berlin, Germany.
374,077. Apparatus for Separating Substances which Volatize at Different Temperatures. Jean A. Mathieu, Detroit, Mich.
374,078. Apparatus for Separating and Purifying the Products of Distillation of Wood. Jean A. Amathieu, North East, Md.
374,085. Hoisting Apparatus. Alexander Ray, Philadelphia, Pa., Assignor of two thirds to Charles S. Lowry and Samuel Ball Van Dusen, both of same place.
374,086. Hoisting Machinery. Alexander Ray, Philadelphia, Pa., Assignor of two thirds to Charles S. Lowry and Samuel Ball Van Dusen, both of same place.
373,123. Caloric-Engine. George M. Hopkins and I. Newton Hopkins, Brooklyn, N. Y.
374,126. Sheet Metal Roofing. Marion F. Kulp, Chicago, Ill., Assignor of one half to Charles L. Kulp, same place.
374,137. Machine for Mining Coal. Peter A. Arp, Philipsburg, Pa., Assignor of two thirds to Charles G. Welch, Osceola Mills, and Clement B. Finley, Philipsburg, Pa.

# THE METALLURGY OF STEEL.*

By Henry M. Howe.

(*Continued from page* 399.)

The eight cases in which the last half of the digits exceeds the first include the immersions with scale-bearing and copper plates, one case of immersion in acidulated water, and all but one of the cases of simple immersion in cold sea and bilge water.

It is impossible to explain away these facts by the influence of manganese and silicon. Thus number 16 Table 44 is numbered 7th in order of combined carbon among Andrews' irons in Table 46. As it has decidedly high manganese and very low combined carbon it should be one of the quickest to corrode, while actually it is the slowest. Many another anomaly, "grateful—comforting," will reward the patient digger.

TABLE 46.—COMBINED CARBON AND RAPIDITY OF CORROSION.

| No. | Observer. | Exposed to or immersed in | Numbered after proportion of combined carbon, 1 highest, placed in order of corrosion, fastest first. |
|---|---|---|---|
| 1 | Parker | Exposure to London air | 3, 4, 1, 2. |
| 2 | Gruner | Exposure to air | (2, 3) **1**.a |
| 3 | " | Cold sea water, simple immersion | **1** (2, 3).a |
| 4 | Mallet | " " " | **11, 6, 8, 7, 3, 9, 1, 5, 10, 2, 4.** |
| 5 | Andrews | " " " " | **1**, 6, 5, 2, **4**, 3, 8, 7. |
| 6 | Parker | " " " " | 3, 2, 4, 1. |
| 7 | " | Cold bilge water, " " | 3, 1, 4, 2. |
| 8 | " | Suspended in marine boiler | 1, 3, 4, 2. |
| 9 | " | " " " | 3, 4, 2, 1. |
| 10 | " | " " " | 3, 4, 1, 2. |
| 11 | Andrews | Cold sea water, in contact with bright wrought-iron | 5, 6, 7, 1, 8, 3, 4. |
| 12 | " | Cold sea water, in contact with scale-bearing iron | 6, 3, **1**, 5, 8, 7. |
| 13 | " | Cold sea water, in contact with copper plates | **1**, 3, 5, 6, 8, 7. |
| 14 | Adamson | Acidulated water | 3, 1, 2. |
| 15 | ... | " " | **5**, 3, **4**, 6, **2, 1.** |
| 16 | Gruner | " " | 2, **1**, 3.a |
| 17 | Parker | Mean of all conditions | 3, 4, 1, 2. |
| 18 | Andrews | " " " | **1**, 6, 3, 5, 8, 7. |

a. Gruner does not give the combined carbon of his irons, but three, spiegeleisen, hard manganese steel and soft steel, are selected, since there can be little doubt that of these the spiegeleisen has the most and the soft steel the least combined carbon.

Heavy-faced type represents cast-iron. Where two numbers are placed in parentheses I do not know which of the two corrodes fastest.

The numbers in line 12 are derived from the specimens 11 to 20 of Table 44, but refer to exposures prolonged beyond the point at which the results in column 16 of Table 44, "scale bearing iron," were obtained.

Line 14, Jour. Iron and St. Inst., 1878, II., p. 398.

Line 14, Ledebur, Handbuch, p. 279.

The following tables, calculated from the results of Parker and of Andrews, are thought to bring out the anomalous relation between corrosion and composition:

TABLE 47.—PARKER'S AND ANDREWS' EXPERIMENTS ON RUSTING.

| Parker's experiments. | Percentage of | | | | | | Relative corrosion mean of all conditions. |
|---|---|---|---|---|---|---|---|
| | Carbon. | Silicon. | Manganese. | Phosphorus. | Sulphur. | Copper. | |
| Landore steel | ·18 | ·013 | ·64 | ·077 | ·074 | ·015 | 1·00 |
| Brown & Co 's steel | ·12 | tr | ·11 | ·056 | ·077 | tr | 1·19 |
| Bolton & Co 's steel | ·19 | ·060 | ·52 | 041 | ·068 | tr | 1·05 |
| Steel of Steel Co. of Scotland | ·10 | ·032 | ·26 | ·057 | ·035 | tr | 1·07 |

| | Andrews' experiments. | Percentage of | | | | | | Relative loss by corrosion in sea water, wrought-iron = 100. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Graphite. | Combined carbon | Silicon. | Manganese. | Phosphorus. | Sulphur. | Simple immersion. | Immersion in galvanic circuit with | | | Mean. |
| | | | | | | | | | Bright wrought-iron. | Scale-bearing iron. | Copper plates. | |
| 1 | Soft Bessemer steel | .... | ·15 | ·01 | ·54 | ·06 | ·11 | ·944 | 1·301 | ·971 | ·791 5 | 1·001 |
| 2 | Soft open-hearth steel | .... | ·17 | ·07 | ·63 | ·08 | ·12 | 1·004 | 1·489 | ·764 | ·861 4 | 1·029 |
| 3 | Soft cast-steel | ... | ·46 | ·07 | ·18 | ·21 | ·02 | 1·290 | 1·332 | 1·210 | 1·031 7 | 1 215 |
| 4 | Hard Bessemer steel | .... | ·51 | ·07 | 1·15 | ·09 | ·11 | 1·169 | 1·284 | 1·126 | 1·00 2 | 1·144 |
| 5 | Hard open-hearth steel | .... | ·72 | ·08 | 1·24 | ·14 | ·10 | 1·032 | 1·105 | 1·133 | 1·016 1 | 1·071 |
| 6 | Hard cast-steel | .... | 1·41 | ·12 | ·86 | ·08 | ·06 | 1·139 | ..... | ..... | ..... 6 | 1·139 |
| 7 | Cast-iron | 1·50 | 2·01 | ·41 | 0·65 | 0·45 | ·25 | ..... | 1·572 | 1·128 | 1·093 3 | 1·264 |

Not to needlessly multiply cases, note how No. 7 of Andrews' which, greatly excelling all others in both combined carbon and silicon and with but a moderate proportion of manganese should corrode the slowest of all, actually corrodes the fastest when in contact with copper, and under the other conditions corrodes much faster than the less corrodible irons and but little slower than the most corrodible ones.

* Copyright by the Scientific Publishing Company, 1887.

Numbering the irons of Table 47 in order of their manganese, 1 having the most, and arranging them in order of corrosion, the fastest-rusting first, then if as is believed manganese hastens rusting, they should stand in sequence, say 1, 2, 3, 4, etc. Actually they are more nearly in inverted than in direct sequence. Parker's stand 4, 3, 2, 1; Andrews' stand 3, 7, 2, 6, 1, 4, 5.

Doubtless composition does influence the rapidity of corrosion; but we may surmise that structure and proximate rather than ultimate composition are the important factors. The local pitting of steel plates, the most dangerous form of corrosion, indicates the local segregation of readily corroding compounds, or, if I may so style them, electro-positive "minerals": Mallet indeed concluded that the homogeneousness of cast-iron influenced its rate of corrosion far more than did its chemical composition.[a]

STRUCTURE.—Experience in the management of chemical manufacturing works, in which the very rapid corrosion of all iron work due to the presence of acid fumes and to various similar causes gives unusual opportunities for observation, seems to indicate clearly that hard, compact, close-grained cast-iron resists corrosion better than the softer, open, dark gray irons;[b] numbers 2 and 3 better than number 1. Mallet indeed reaches the opposite conclusion from his small scale tests,[c] but I find little justification for his belief. Taking the average of all his conditions of exposure (hot, cold and foul sea water, pure and foul fresh water, and damp air), his number 1 irons in both series corrode about 30% faster than those of lower grade under identical conditions.

In pure sea water the rates of corrosion are nearly identical in his experiments, the average corrosion in four exposures of number 1 iron being about 4% greater than that in fourteen exposures of harder iron. It is uncertain whether the greater corrodibility of the softer irons is due chiefly to structure, to composition, or to composition as governing structure, or to the greater resisting power of their skin.

SIZE.—Immersing 26 pairs of specimens of cast-iron, each consisting of one block 5 inches × 5 inches × 1 inch, and of a similar one 5 inches × 5 inches × 0·25 inch, in pure sea water for 387 days, Mallet found that the thin piece in every case corroded faster, and generally very much faster, than its companion. On reimmersing them for 732 days, in 21 out of the 26 pairs the thin piece still corroded faster than the thick, but the difference was less marked than before, while in five pairs the thick piece corroded somewhat the faster. He attributed this to the greater heterogeneousness of the thin piece: but the slow cooling of the thick piece should give better opportunity for segregation during solidification, and the difference seems more naturally attributable to a difference in the structure of the metal, or in the thickness or adhesiveness or

[a] Op. cit., 1843, p. 4. Mallet considered that chilled cast-iron corroded faster than that cast in green sand: and this he attributed to the heterogeneousness of the former, citing in support of this the fact that its rusting was tubercular, which he considers an unfailing index of heterogeneousness (Idem, 1840, p. 234). In earlier and briefer exposures chilled iron nearly always corroded much faster than similar unchilled iron in foul sea water; but I am inclined to attribute this to individual peculiarities of certain of the specimens. For in the same series there was little difference between the rates of corrosion of chilled and unchilled irons, otherwise similar, in pure sea water, and in river water pure or foul: while in the later series whose results are given in Table 44 we find that even in foul sea water the chilled iron corroded slower than the unchilled: and that in cold pure sea water and in river water, whether fresh or foul, their corrosion was closely similar, while chilled iron corroded about twice as fast in hot sea water yet only half as fast in damp air as similar unchilled iron.

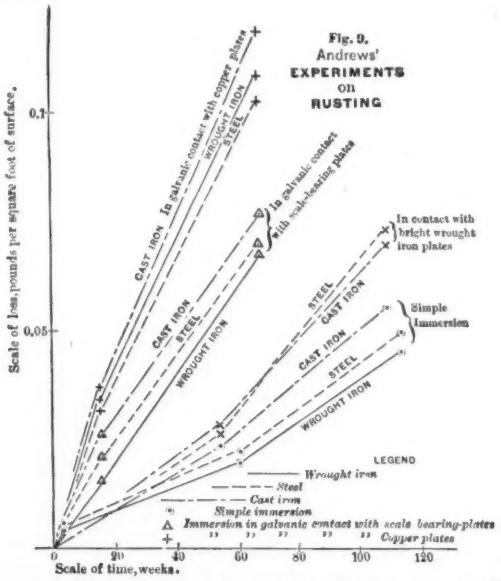
[b] Several very experienced an intelligent managers of chemical works assure me that their experience fully agrees with this statement. It seems to be true both of corrosion by air slightly charged with acid fumes, and by brine.

[c] Op cit., 1843, p. 5.

corrodibility of its skin, due to different rates of cooling.

§ 165. CAST-IRON VS. STEEL AND WROUGHT-IRON.—In general cast-iron corrodes much less readily than malleable iron, but this is certainly in large part and perhaps wholly due to its tenaciously held skin. Thus in Table 44 Mallet's skin-bearing cast-irons under all conditions corrode less than his wrought-iron and steels, though in pure river water the difference is comparatively slight. But the planed cast-irons of Mallet, Andrews and Gruner on the whole corrode rather faster than unprotected wrought-iron and steel. Mallet and Gruner indeed find that planed cast-iron corrodes more slowly than malleable iron when simply exposed to the weather: but it corrodes on the whole decidedly faster than malleable iron in cold sea water, whether simply immersed or in voltaic contact with copper or with scale-bearing wrought-iron. In three out of the four groups in figure 9 the corrosion of cast-iron outstrips that of malleable iron.

In Gruner's experiments the planed cast-iron corrodes in sea water from about 2 to 3·5 times as fast, and in acidulated water from 0·8 to 14 times as fast as the fastest corroding carbon steel.




INFLUENCE OF TIME AND OF GALVANIC CONTACT WITH ELECTRO-NEGATIVE SUBSTANCES ON RUSTING IN SEA WATER.

§ 166. THE RELATIVE CORROSION OF WROUGHT-IRON AND STEEL is a question whose economic importance I hope justifies the length at which I shall consider it. I first present the results of experiments on a small scale, then those of actual experience in use in land and marine boilers, ships' hulls, etc.

As already indicated, there is probably no important difference in the rate at which these two classes of iron corrode under ordinary conditions. It is true that our small scale tests indicate under certain conditions steel corrodes much faster than iron: but at least under some of these this is opposed by experience on a large scale. It is to be observed, however, that if, as is probable, the two metals corrode equally per square foot of surface per annum, steel suffers more per unit of strength. A steel plate of the same strength as an iron one is considerably thinner; and if each loses the same thickness in the same time, the steel plate becomes finally considerably weaker than the iron one. Hence, where serious corrosion is to be expected, it is not prudent, in substituting steel for wrought-iron, to reduce the thickness proportionally to the increased strength of the metal. And where transverse as well as tensile stress is to be resisted, it is also to be remembered that a steel piece, whose cross-section is such that it is tensilely just as strong as a thicker one of wrought-iron, is by no means as strong transversely.

While it would hardly have been surprising had a decided difference in the corrodibility of these two classes of iron been proved to exist, I do not know that there is any strong reason to expect such a difference on a priori grounds. We have seen that there is comparatively little difference between the corrodibility of wrought- and of skinless cast-iron, though their compositions differ so greatly. As steel resembles wrought-iron much more closely in composition than cast-iron, no serious difference in corrodibility need be expected on the score of composition. Beyond this, wrought-iron differs from steel in having a small quantity of slag mechanically intercalated, which if anything should hasten its corrosion. Beyond this there appears to be a decided difference in their structure, due at least in part to the presence of that slag in the one and its absence from the other. But I do not know that this difference is of a kind which should be expected to affect corrodibility.

It appears tolerably certain that the mild steel of to-day compares more favorably with wrought-iron in corrodibility than that formerly made. This may be due to former neglect to remove its scale, or to present greater regularity in the proportion of manganese and perhaps of other elements which tend to segregate, and which, if even occasionally present in excessive proportions would, by assisting segregation, lead to the formation of spots differing in potential from the mass of the metal, and thus leading to aggravated local corrosion. Or, again, carelessness in recarburizing may have formerly led to heterogeneousness and difference of potential.

A. SMALL SCALE TESTS indicate that in cold sea water, whether pure or foul, and whether it be simply immersed in it or in galvanic contact with bright wrought-iron, with scale-bearing iron, or with copper, as well as in pure fresh water, steel corrodes at about the same rate as wrought-iron. The data are not always harmonious: but where they are discordant those which point to steel as the more corrodible are so far offset by others pointing in the opposite direction as to strongly suggest that there is no important difference. But in hot sea water, *e. g.* in marine boilers, and when exposed to the weather, our small scale tests indicate that steel is decidedly the more corrodible of the two: while our rather scanty data concerning the effect of acidulated water and sewage-bearing river water point rather to wrought-iron as somewhat the more corrodible. This is summed up in Table 47 A.

TABLE 47 A.—RELATIVE CORROSION OF WROUGHT-IRON AND STEEL, SMALL SCALE TESTS.

| Conditions of exposure. | Relative corrodibility. | Quality of evidence. |
|---|---|---|
| A. In pure cold sea water— | | |
| 1. Simple immersion | Corrode nearly equally | Abundant and tolerably harmonious. |
| 2. Steel and bright wrought-iron in galvanic contact. | Probably little difference | Contradictory. |
| 3. In galvanic contact with { scale-bearing iron / copper. | Nearly identical / " " | Scanty; tolerably harmonious. / " |
| B. Hot sea water | Steel much the more corrodible, perhaps by 50% | Very harmonious, tolerably abundant. |
| C. Exposed to the weather | Soft steel corrodes decidedly faster than wrought-iron | Harmonious scanty. |
| D. In foul sea water | Nearly identical | Harmonious; moderately abundant. |
| E. In pure fresh water | " " | Rather scanty. |
| F. In foul " " | Steel rather the less corrodible. | |
| G. In acidulated " " | Steel decidedly the less corrodible | Scanty. |

(TO BE CONTINUED.)

**NOTE.—The publishers of the ENGINEERING AND MINING JOURNAL will thank the readers of this article if they will promptly call attention to any inaccuracies they may observe in it.**

## PERSONAL.

Prof. Wm. P. Blake is about to start for Idaho on professional business.

Dr. A. L. Ankeny, of Clinton, Iowa, who has been traveling in Europe for his health, died at Calais, France, on the 23d ult. Dr. Ankeny was interested in many mines in the Black Hills, Dakota.

Mr. George D. Roberts sailed for the United States of Colombia last week for the purpose of an examination of the mines owned by the El Talento Gold Mining Company. He will probably return in February.

Mr. T. W. Robinson, formerly chief chemist to the Joliet Steel Company, and Mr. M. C. Snelling Robinson, formerly with the Colly mine, have formed a partnership and opened a laboratory at Duluth, Minn.

Mr. Henry G. Morse, formerly connected with the Morse Bridge Company, of Youngstown, Ohio, has accepted the position of general manager of the works of the Edge Moor Iron Company, at Wilmington, Del.

It is reported that C. K. Garrison, Jr., and C. R. Garrison, sons of C. R. Garrison, of St. Louis, while ascending the shaft in a zinc mine at Webb City, Mo., in a cage, the cable broke throwing them to the bottom, on the 28th ult. The two men were interested with their father in the St. Louis Ore and Steel Company.

Mr. Wells Burt died at his home in Detroit on November 29th, aged sixty-nine years. He located many iron mines in the Lake Superior region, and was a large stockholder in the Lake Superior Iron Company, of Ishpeming, in the Union Iron Company, and Peninsular Iron Company, of Detroit.

Information has been received in this city announcing the death in Sheffield, England, of Thomas Jessop, of the firm of Jessop & Sons (limited), at the age of eighty-three years. He was interested for many years in the manufacture of crucible steel, and his operations were so extensive as to earn him the title of "The Steel King."

## FURNACE, MILL, AND FACTORY.

The property of the Rorer Iron Company, Roanoke, Va., including the narrow gauge railroad, has been sold to a syndicate.

The Coplay Iron Company is talking of blowing out two of its furnaces now in operation at Coplay, Pa., owing to the poor quality of coal furnished.

The Kittanning Iron Mill, Kittanning, Pa., has shut down indefinitely, on account of a dispute with the puddlers about the iron furnished by the iron company for them to work.

The first shipment of stoves from the Reading Stove-Works, Reading, Pa., to Germany was made last month. The stoves were sent to Berlin, Prussia, where an agency has been established.

Stack No. 2, of the Lehigh Iron-Works, Allentown, Pa., which has been out of blast for several weeks owing to the poor quality of coal furnished it, is being prepared for relighting when the strike is ended.

The Pneumatic Pulverizer Company, of this city, shipped last week a plant of ten pulverizers to East Liverpool, Ohio, to pulverize flint and spar for potters' use. They have also made two contracts for plants for gold ore.

The new Bessemer steel-works of the Old Dominion Iron and Nail-Works, at Richmond, Va., have been blown in. They consist of two 3-ton Bessemer converters and a blooming mill, and the steel will be used in the production of slabs and billets, nails, etc. This company is the sole manufacturer of the Walker horse and mule shoes.

The Ashland Iron and Steel Company's works at Ashland, Wis., are nearing completion, and will shortly be ready to begin operations. Arrangements have already been made for an enlargement of the plant next year by the addition of another furnace of the same capacity as the one erected, together with a Bessemer steel plant and nail mill.

A new barb wire mill is to be added to the Cambria Iron Company's plant, at Johnston, Pa. It will contain 85 machines and will make the twisted wire. The new mill will occupy the building formerly used by the Iowa Barb Wire Company. It is understood the Cambria people have purchased the machinery, good will and patents of one or more large factories in the West, the principal one being at Chicago. The wire manufactured is not of the Washburn-Moen patent.

The Webster, Camp & Lane Machine Company, of Akron, Ohio, have shipped a plant of pumping machinery to the Cleveland Iron Mining Company, of Ispheming, Mich., consisting of two 14-inch Cornish plunger pumps and one 14-inch bucket lift pump, all 9-foot stroke; also, the rod connections and a heavy 25-foot cast-iron pump bob: and to the Penn Iron Mining Company, for their West Vulcan mine, two 12-foot band friction hoisting drums and a 28 × 48-inch automatic cut-off engine.

The Bessemer steel plant of the East Chicago Steel Works, at Hammond, Ind., is now in operation, and these works have turned out the first Bessemer steel ever made in the State of Indiana. Up to this time the nail factory has been running on purchased steel, but it is now expected that the works will produce their own steel. It will be necessary to purchase pig-iron, as no blast-furnaces have been erected. The capacity of the steel plant is about 250 tons of ingots a day, but at first from 50 to 75 tons will be made daily, as that will supply all requirements. Only soft steel will be turned out, suitable for nails and other products requiring material of this character. The productson of the steel works will, of course, be in time greatly in excess of the requirements of the nail factory, but it is expected that an outlet will be provided near at hand in the shape of a mill for rolling structural shapes and another for rolling plates, both of which are contemplated at Hammond by other parties.

A meeting of the steel car spring manufacturers of the country was held at Pittsburg, Pa., this week, for the purpose of forming a national organization to keep up prices and otherwise secure mutual protection of business interests. Fifteen firms were represented, viz.: The National Car Spring Company, of New York; the Chicago Tire and Spring Works; the Detroit Spring Company; the Atkinson Car Spring Company, Chicago; the Pickering Spring Company, Philadelphia; the Cliff & Righder Spring Company, Oswego, N. Y.; the Lehigh Valley Spring Company; the Compton Spring Company, Compton, N. J.; the Davis Spring Works, Wilmington, Del.; the Faris Spring Company, Bridgeport, Conn.; the French Spring Company, and Anderson DuPuy Company, of Pittsburg; Miller, Metcalf & Parkin; the Diamond State Spring Company, Philadelphia; Charles Scott Spring Works, Philadelphia, and the Richard Vose Spring Works, of Newark, N. J. A temporary organization was effected by the election of Benjamin Atha, of the National Works, New York, as chairman, and Edward Guibert, of the Vose Company, Newark, N. J., as secretary.

## CONTRACTING NOTES.

Contracts open will be found on pages xiii and xix. New contracts this week: No. 656, Plans and Specifications; No. 657, Wrought-Iron Bridge Abutments; No. 658, Water Meters; No. 659, Masonry, Grading and Trestling; No. 660, Street Railway; No. 661, Bridge; No. 662, Harbor Improvement; No. 663, Drilling Artesian Well; No. 664, Gas and Cannel Coal; No. 665, Improvement of the Harbor of Pernambuco, Brazil.

The Navy Department has invited proposals for supplying a submarine vessel for naval purposes. It is stated that the patents of this nature are numerous, but no other navy in the world has yet taken a practical step toward their adoption.

## LABOR AND WAGES.

A large meeting of the flint and lime-glass manufacturers was held in Pittsburg, Pa., this week. A new scale of wages was considered which changes the present system of working. It is reported that there is a move on hand to ignore the Flint Glass Workers' Association and have each manufacturer present the scale to his own men.

Miners' Assembly No. 135 will hold a general conference in Pittsburg, Pa., December 3d, with the railroad coal operators. It is said the Federation of Miners and the Knights have entered into an agreement to shut down every mine in the United States which refuses to pay the advance asked. This will send hundreds of miners on strike in the Southern part of Indiana and Illinois.

The eviction cases of the Stout Coal Company, of Milnesville, Pa., against the striking miners, to which we referred in our issue of November 19th, were decided in favor of the miners November 26th. Judge Woodward granted a rule to strike off judgments entered by the company for dispossessing the striking tenants. The men will, under these rulings, hold possession of their houses during the remaining time of the strike, and cannot be evicted. It is stated that the strikers are as firm as when they first stopped work, and the outlook for resumption in the Lehigh region is not encouraging.

An important meeting of the Pittsburg & Southern Coal Company, comprising nine of the largest river coal shippers of this district, was held at Pittsburg, Pa., on the 28th ult. The meeting was called to consider a communication from Miners' Assembly No. 135, Knights of Labor. All the river miners of the Monongahela and Youghiogheny districts are represented by the Assembly in their proposition, which is that they must be paid fortnightly and receive other concessions or they will strike. Inasmuch as no coal will go out until there is a decided rise in the river there can be no strike at present. It is desired, however, to have some arrangement made under which the men can work satisfactorily when operations are resumed. At the shippers' meeting it was decided to confer with 100 other operators up the river and get their opinion of the matter.

Messrs. Ario Pardee & Co., at Hazelton, Pa., on the 28th ult., announced their intension to make another effort to resume work at their collieries. Notices in English and German were posted at their offices stating that a number of their men had expressed to them a desre to go to work again and giving notice to all others who wished to resume work to leave word at their pay office. The firm state that they will pay 4½ per cent advance in wages, this advance having been made last month in accordance with the advance made on the basis of the price of coal at tide-water shipping points. The leaders of the strike will advise the men to stand firm and not to accept this proposition, but it is generally believed that many of them will go to work again. Messrs. Coxe Bros. & Co., whose miners are on strike for an increase in wages, have refused to meet any committee of arbitration, but will treat with a committee of their employés.

## GENERAL MINING NEWS.

Shipments of iron ore from the mines of the districts mentioned below for the season up to and including November 26th, as reported by the Marquette *Mining Journal*, were as follows:

| | Tons. 1887. | Tons. 1886. |
|---|---|---|
| Marquette, Marquette District | 803,411 | 841,802 |
| St. Ignace, " " | 91,544 | 72,294 |
| Escanaba, " " | 862,799 | 654,865 |
| " Menominee District | 1,132,611 | 860,710 |
| " Gogebic District | 50,608 | ..... |
| Ashland, Gogebic District | 1,040,727 | 709,405 |
| Two Harbors, Minnesota Iron Company, Vermillion District | 390,467 | 304,396 |
| Total tons | 4,372,167 | 3,443,472 |

STANDARD OIL COMPANY.—It is stated that this company is now laying a grand trunk pipe line from Chicago to New York by way of the Ohio and Pennsylvania oil fields. The pipe line, when completed, will be nearly 1000 miles long, and will cost at least $5,000,000. It will connect the Ohio and Pennsylvania fields, and oil can be piped eastward or westward as desired. The Standard Company has already begun to lease the right of way through Ohio and Indiana. Thousands of the best oil lands have been secured, and the intention is to develop and test all the country between Chicago and Lima, Ohio. The step was made necessary by the high railroad rates consequent upon the enforcement of the Inter-State Commerce law. The company will utilize the oil pipes to Chicago for fuel as well as illuminating purposes.

### ALABAMA.

#### DE KALB COUNTY.

FORT PAYNE COAL AND COKE COMPANY.—This company, which has a capital stock of $100,000 proposes to erect coke-ovens at Fort Payne. The officers are: J. M. Ford, Kansas City, Mo., President; U. B. Pearsall, of Fort Scott, Kas., Vice-President; E. W. Godfrey, of Fort Payne, Ala., Secretary, and F. Moody, of Kansas City, Treasurer.

### ALASKA.

ALASKA MINING AND MILLING COMPANY.—This company, which owns the Treadwell mine on Douglass Island, is now constructing chlorination works of a capacity of 18 tons of sulphurets daily.

### ARIZONA.

#### MOHAVE COUNTY.

CHEMEHUEVIS MINING AND MILLING COMPANY.—This company has been organized in San Francisco, with a capital stock of $5,000,000, shares $50 each, to work a group of gold and silver bearing mines situated in the Chemehuevis range. The directors are: William H. Jordan, Gen. H. B. Davidson, R. H. Ostin, H. Bartling and Arthur Bull. Considerable work of development and ore extraction has already been done on the property by private enterprise, and the present incorporation is for the purpose of operating on a larger scale.

### CANADA.

#### PROVINCE OF QUEBEC.

MEGANTIC MINING COMPANY.—Recent developments on this company's property one mile from Coleraine show a large deposit of asbestos. Important heavy work has been done during the past season, and it is stated that about 5000 square yards have been excavated, which shows an average depth of twenty-three feet, covering a large surface area. There are innumerable veins of asbestos exposed, ranging from ¼ to 1½ inch. Work has been suspended for the winter, but will be resumed in the spring.

### COLORADO.

#### ARAPHOE COUNTY.

It is reported that the company which has been operating on the Duryea process of treating ores at Silver Cliff for a few years past say they can now smelt refractory metals at a profit, and that they propose to put up extensive works at Denver.

#### CHAFFEE COUNTY.

LADY MURPHY MINING COMPANY.—The vein was struck on this company's property November 27th, and reports state it had been pierced six feet, and still the side wall had not been struck.

#### CLEAR CREEK COUNTY.

The case of Duncan McBride vs. George R. Gwynn and others was argued before Judge Hallett at Denver last week. Among the defendants was the Great West Mining Company, one of the corporations instituted by "Brick" Pomeroy. The property is near Idaho Springs. A motion to set aside a commissioner's deed and to annul the sale of the property was brought. The court ruled that the motion to set aside the deed should be granted, but that the motion to set aside the sale should be denied.

NEATH MINING COMPANY.—The shaft and mill buildings at this mine are well under way and the machinery for the mill is now on the ground.

RED ELEPHANT.—Work has been resumed at this mine. The shaft will be sunk two levels deeper and a cross-cut run to the Free America mine, which will give drainage for all time. Water is to be pumped out of the Hanning ground to allow resumption of work in that portion.

LAKE CO UNTY.

We condense the following from the Leadville *Herald-Democrat:*

In chancery in the United States Court at Denver, an order was made on November 23d, in the case of Joseph Reynolds vs. Thomas Weir, Benjamin Guggenheim, Henry Walker and the Nisi Prius Mining Company, the bill being for an injunction and for other relief. Application had been made by William Gleason, Frank H. Officer and Henry Higgins, assignees, for the benefit of the Leadville Mining and Tunneling Company, of the lease from the Nisi Prius Consolidated Mining Company and Weir and Guggenheim for leave to continue work by said petitioners on the portion of the Wells & Moyer placer mining claim, which is situated in California mining district, which is known as the Weir lease ground.

CHRYSOLITE SILVER MINING COMPANY.—This mine continues to be a large shipper. For some months shipments have been at the rate of 1400 per month. Most of this is iron, although there is some ore, about 200 tons being shipped last month. Considerable ore is obtained in sorting over the old dumps. The old dumps are being turned over and sorted on company account. This work will have to be suspended, however, after the first heavy snow. Work in the mine is being done for the most part by lessees. The company will no doubt do some prospecting work before long. There are some sixty acres of ground unprospected in the north and west portions of the company's territory. A second contact has been proved in several places in the Chrysolite, and considerable work has been done in it. So far it has, however, been very unproductive. The iron found there carries a very high excess of iron over silver, but a very small amount of silver. The Colorado Chief No. 2 shaft reached the second contact at a depth of about 225 feet. The concentrating mill has been shut down.

IRON SILVER MINING COMPANY.—Some good sulphide ore from the Moyer shaft has been shipped to the Manville smelter. It assays high in lead and comparatively low in zinc.

MATCHLESS.—The Boan shaft is still in iron, through which streaks and stringers of ore are interspersed. Some of the iron carries silver chloride. Assays as high as 100 ounces in silver have been obtained. The shaft has now cut through the iron for a distance of six or eight feet. The character of the iron is similar to that struck in the No. 4 shaft of the Dunkin.

MIAMI.—Work has been suspended at this mine. When it stopped the prospects for making a good strike of ore were favorable. The iron carried but a small amount of silver, although it had an excess in iron. The Miami was one of the most important as well as one of the most promising prospecting enterprises of all those in progress in the vincity of Leadville. This shaft will be more than temporary, for if the St. Louis parties who have been promoting this enterprise do not care to put up more money there are plenty of others who will. The property is located directly in the trend of the great Fryer Hill ore chute, which has been followed from the Chrysolite to the Tiptop and Joe Davis, and now recently shown in the Olive Branch.

OLIVE BRANCH.—Prospects in this mine continue to improve. The No. 3 drift continues to keep in ore as it is driven forward. This drift is following a streak of very rich ore. The streak is in the neighborhood of 4 feet wide, and assays from the breast go about 400 ounces in silver and occasionally as high as 900. The ore outside of this streak assays about 70 ounces, and is a most desirable smelting ore. It is oxidized in character, and carries from 25 to 30 per cent excess in iron, with but traces of zinc and sulphur. It is shipped to the Harrison Reduction-Works. The workings of the Olive Branch, since the shutting down of the Miami, are making considerably more water. The pumps are now raising about 200 gallons per minute. The water, so far, is causing no trouble.

ROBERT E. LEE MINING COMPANY.—This company is shipping about 100 tons of iron per day, but this amount will probably be increased to 160 or 175 tons before long. Some of the Robert E. Lee iron is said to be the best produced in Leadville, assaying 45 to 50 per cent. excess in iron and manganese, and 15 to 20 ounces in silver.

SIERRA NEVADA.—The ore in this mine has become very low grade. It carries no more than 12 ounces of silver, 15 to 20 per cent lead, and runs as high as 30 per cent zinc. Work in some of the best ground is enjoined on account of the conflict with the Moyer placer.

ST. KEVIN MINING COMPANY.—About four tons per day are now being hoisted from the mine. Shipments have not yet begun, and the ore is being stored in the bins. The ore is stoped from the ground above the southwest drift of the 300-foot level. Stoping will also be commenced in the ground over the 250-foot level very soon. The ore body, as it shows in the breasts of the drifts, is from three to eight feet wide. From one to two feet is good smelting ore; the balance is of very fair grade, but has to be dressed before shipping. The 350-foot level is now being driven to cut it, and should strike the ore in about 30 feet more. The mill has been put in repair, and is now said to be running quite successfully, on half time.

LAS ANIMAS COUNTY.

The coal lands at Trinidad formerly owned by General E. B. Sopris have passed into the ownership of the Denver Steam-Heating Company, who will at once commence the erection of 250 coke-ovens.

PITKIN COUNTY.

The ore shipments from Aspen are about 800 tons daily. The present shipments, however, do not represent the producing capacity of the Aspen mines, and six months at least will elapse before the statements of the railway companies' shipments can be accepted as a criterion of the camp's production. After that time the ore now on hand will have been moved, and all the mines that were waiting for shipping facilities will have started up.

The Park, Regent and Tiger group, on Smuggler Mountain, were owned by Devereux Brothers, Dave Miller and M. A. Beard. The two former sold to Messrs. Clark, Wright and Dunbar a one third interest for $20,000. Since then Miller and Devereux have bonded and leased of J. B. Stillwell a one fourth interest in these claims for $20,000, and they will have to take up this bond six months from the time the Boulder people ship ore from the Park claim. Mr. Clark is anxious to buy the Beard one sixteenth interest. Mr. Beard now holds his interest at $30,000. The Regent shaft is now down to the contact, 535 feet, and they are drifting for the hanging-wall. This shaft is between two large bodies of discovered mineral—the J. C. Johnson on one side and the mineral discovered on the Park claim by the Boulder people. A plant of machinery is on the claim. This property is under the management of Mr. Yankee, through whose advice it was bought by Clark, Wright and Dunbar.

BONNY BELL.—The injunction on this mine only restrains it from working into the lines of the Durant. The mine is not shut down. The strange part of the case is that the Durant is fighting the Bonny Bell apparently from a side-line standpoint, the ore-body in the latter dipping under the former.

DAKOTA.

LAWRENCE COUNTY.

DEADWOOD SMELTING COMPANY.—At a recent meeting it was decided to erect leaching-works suitable for treating the ores of Bald Mountain and Ruby Basin districts. To the treatment of these ores we referred in our issue of November 19th.

IRON HILL MINING COMPANY.—The company is still working three sets of steam hoisting apparatus on ore. Prospecting by means of the diamond drill is continued, and recently resulted in finding a quantity of high grade lead ore on the 200 foot level. The Home Run, Combination and No. 2 shafts still continue furnishing quantities of good ore.

ENGLAND.

According to cable reports dated November 28th, an explosion occurred in the Aberrant colliery, Aberdaire, on the morning of that day. It is reported there were 560 men in the mine at the time, but that 220 have been got out during the day through an old working. The others are still entombed, and there are hopes that all may yet be saved.

IDAHO.

The new Silver Star mill, in Smoky, is working successfully. It has 20 stamps and 16 Frue vanners, which make about 12 tons of concentrates daily. Fifty tons of ore are crushed daily, but this quantity will shortly be increased to 60, when 15 tons of concentrates will be produced. These concentrates average 110 ounces in silver and $20 in gold, or about $125 per ton. The product of the mill will be hauled to the Ketchum smelting-works, a contract covering the ensuing winter months having been made.

ALTURAS COUNTY.

CAMAS NO. 2.—It is stated that the owners have an offer for a large sum in cash for their property. The hoisting works recently destroyed by fire are being rebuilt.

JUNCTION MINING COMPANY.—The tunnel and drifts are under contract to be completed in 90 days from the 1st inst. This work is being done for the purpose of developing the ground sufficiently to ascertain the proper place for the permanent workings. The machinery for the new hoisting works and pumps to be erected at the mine next spring, as soon as the tunnel and drifts shall be completed, has been purchased by the company.

NAY AUG MINING COMPANY.—The company will carry on work all winter.

PARKER MINING COMPANY.—This company, recently organized at Hailey, has a capital stock of $1,500,000, owns all the original Parker group, comprising some 300 acres of ground, being one mile in length on the Parker-Elkhorn and Amicus belt, by half a mile in width. The directors are W. P. Jenney, W. H. Watt, Sam. Allen, Littleton Price, and J. O. Swift.

QUAKER CITY MINING COMPANY.—This company owns all the claims formerly owned by John R. Clark, of Lincoln, Neb., and W. P. Jenney, of Hailey and has a capital stock of $100,000.

TAHOMA MINING COMPANY.—Arrangements have been made to increase the capacity of the mill situated at Atlanta. Twenty additional stamps and eight Frue vanners will be put in, and the mill will be worked all winter.

WESTERN RESERVE MINING COMPANY.—This company owns the Gondola, Amicus, and another claim—altogether 65 acres, being half a mile along the Parker-Elkhorn-Amicus belt or vein, by the width of an eighth of a mile. The capital stock is $10,000,000. The officers are: President, W. P. Jenney; Vice-President, J. O. Swift; Manager, Sam Allen; Superintendent, Secretary, and Treasurer, W. H. Watt.

ILLINOIS.

It is reported that Mr. T. L. C. Lowe, of the Lowe Manufacturing Company, of Morristown, Pa., is organizing a large company in St. Louis to operate a fuel gas plant. The plan is to manufacture gas at a central point in the coal district of Illinois, just east of St. Louis, and bring it there in pipes.

The State Board of Labor Statistics will soon issue a complete report on the mines and mining operations of the State for the year ended July 1st last. The report will show a somewhat improved state of affairs over the preceding year. The coal output of the year was 10,278,890 tons, being fully a million tons in excees of the preceding year, and considerably the largest in the mining history of the State, while the indications are favorable to a still larger output for the year now current. There are now 817 mines and openings of all kinds in operation in the State.

JEFFERSON COUNTY.

HILLSBORO MINING COMPANY.—This company, which began the work of sinking a shaft at Hillsboro last summer, has struck an 8-foot vein of fine coal at a depth of 446 feet. The machinery for operating the new shaft is now in place, and the company will soon be ready to place their coal on the market.

INDIANA.

CONSUMERS' GAS TRUST.—This company has raised $500,000 by popular subscription at Indianapolis, the purpose being the piping of natural gas in that city, the same to be furnished to consumers, particularly manufacturers, at cost. Operations will be begun at once. The movement is of a purely popular character, the number of subscribers exceeding 4500. It is claimed that this trust will be able to furnish natural gas at lower prices than in any other city in the country. The gas will be brought a distance of varying from nine to twenty miles.

GIBSON COUNTY.

Natural gas was struck on the 19th inst. at Princeton, twenty-six miles north of Evansville, at a depth of 600 feet.

MIAMI COUNTY.

Natural gas has been struck at Xenia, 18 miles south of Peru, at a depth of 900 and 27 feet in the Trenton rock.

MICHIGAN.

The Detroit *Journal*, on November 29th, published the result of its investigation into the Michigan swamp land matters and the Chandler claim against the Calumet & Hecla Mining Company, which was referred to in THE ENGINEERING AND MINING JOURNAL of November 19th. This investigation shows that J. H. Chandler, E. W. Sparrow and the Seager estate are entitled to locate 6000 acres of swamp land, and also that the State of Michigan is prosecuting claims against the General Government which cannot fail eventually to bring into the State Treasury at least $2,000,000 as payment for 1,700,000 acres of swamp land, due from the United States to the State of Michigan. The fact also transpires that certain Michigan railroads and corporations are now holding, or have sold, upward of 300,000 acres of land to which they have had no just title, and that suits are to be brought by the State against the Flint & Pere Marquette, the Jackson, Lansing & Saginaw, and the Grand Rapids & Indiana railroads, to recover 180,000 acres of land illegally held by them through grants of Congress.

COPPER MINES.

CALUMET & HECLA MINING COMPANY.—It is stated that the theory that the fire at the mine was the work of an incendiary has now been given up, and the mine officials admit that the fire probably came from number two shaft, where the fire broke out last July, on the sixteenth level. The July fire was never put out. The damage to the shaft could not be repaired two weeks ago when men were sent down, on account of the heat and stifling gases coming from the proximity of the sixteenth level. The fire got into a part of the mine where rock had been taken out, and the openings filled with timber and refuse. There it was inaccessible, and, when the conditions were favorable, the flames got a fresh start. No miners being at work after eleven o'clock on Saturday night, the fire burned on undisturbed until six o'clock the next morning, by which time it had assumed such proportions as necessitated the closing down of the mine. The method of fighting the fire has been changed, carbonic acid gas being forced down number two shaft, Hecla, at the rate of one hundred thousand cubic feet per day, and pipes exhaust the air from number one shaft, thus making a circuit. Good results have followed so far. It is probable that the fire will burn for some time. It is very difficult work on account of the inaccessibility of the parts of the mine in which the flames are kept alive. Preparations have been made for a long fire. Ten stamp heads are now idle, and five furnaces at the smelting-works were blown out November 25th.

TAMARACK MINING COMPANY.—This company will soon put into practice the plan of numbering its employés in the mining and timbering departments, and in some of the minor branches of the work. Thereafter the men will be known to the timekeeper and clerks by their numbers instead of their names. The advantages claimed for this system are that it obviates the difficulties which arise from the custom in vogue among many foreigners of frequently changing their name, and from the absolutely unpronouncable names of others. It is also more convenient to the timekeepers and clerks. The plan, it is said, has been in use at the Osceola mine for some time. At the mine the sinking of No. 1 shaft has been resumed, and it is now 17 feet below the eighth level. The product of the mine in November was 535 ton of mineral, the largest monthly output yet recorded.

IRON MINES.

AURORA MINING COMPANY.—D. N. Moore, H. S. Benjamin, and F. A. Bates have resigned from the

directory of this company. Judge Burke, James Corrigan, of Cleveland, and T. T. Ives, of Meriden, have been elected to the directory. Judge Burke has been made President, A. S. Upson Vice-President, C. F. Rand Secretary, and Captain N. D. Moore General Manager.

MOUND CITY MINING COMPANY.—The machinery of this company has been attached by Charles McCann for a debt of $1,600. This property is said to be a promising one, situated between the Mikado and Pilgrim, and was formerly known as the Alward. Messrs. Littlefield and Wheaton, of St. Louis, who comprise the Moore-Benjamin Investment Company, of that place, are the principal owners of the property. The property is stocked for 100,000 shares. The Bessemer Iron *Spirit* says that the company has made a number of false and exaggerated statements regarding the prospect. They claim they have a 50-foot vein of ore, whereas they have not as yet discovered any clean ore at all. It is also said that the workmen at the property have not been paid for two months.

## MONTANA.

### DEER LODGE COUNTY.

HOPE MINING COMPANY.—A strike of an 8-inch true fissure vein of ore in the Silver Chief lode is reported. Assays of the ore gave from 130 to 160 ounces, or an average of 147½ ounces per ton. The ore had traces of gold.

### JEFFERSON COUNTY.

BIG FOOT CONSOLIDATED MINING COMPANY.—The water is all out of the mine and the work of development will begin without delay. The property of the company is south of Boulder.

ELKHORN MINING COMPANY.—The decision given in favor of this company in the suit of A. F. Bright *et al.* for the A. M. Holter lode, referred to in our last issue, was made by the register and receiver of the Helena land office, and not by the commissioner of the general land office.

ST. PAUL & HELENA MINING, MILLING AND REDUCTION COMPANY.—This company has been organized with a capital stock of $1,000,000, shares $5 each, to operate the Bamboo Chief and Pilot No. 2 mines. The principal place of business will be at Helena. The incorporators are: Welter E. Blake, Benjamin F. Forbes, Isaac Boyer, and Adelbert A. Lathrop.

### SILVER BOW COUNTY.

BLACK PINE MINING COMPANY.—At a meeting of this company, to which we referred in our last issue, held at Butte, November 21st, the list of subscribers for mortgage bonds was presented, which, though showing liberal subscriptions from a few of the stockholders, was entirely inadequate to meet the requirements of the company. It was decided that the mortgage-bond proposition for relieving the company had been before the stockholders for a sufficient length of time to give it a fair test, and that the result had been a failure, which must inevitably result in wrecking the old company by forcing a sale of its properties under the hands of the sheriff for the satisfaction of judgments, the execution of which could not be longer delayed. It was resolved that a subscription be started for the purpose of raising a fund to be placed in the hands of a syndicate formed from among those stockholders who desired to protect their interests at the coming sale. Each stockholder has the privilege to take shares in the syndicate at 20 cents each to a number equal to his present holding.

LEXINGTON MINING COMPANY.—Official advices to us show that the production for October amounted to $65,662.29 in silver and $10,674.99 in gold, making a total of $76,337.28.

## NEVADA.

### ELKO COUNTY.

The total shipments from the mines at Tuscarora so far the current year foot up only $52,000.

COMMONWEALTH MINING COMPANY.—The hoisting works have started up and sinking in the main shaft resumed. There is considerable water, but good headway may be expected.

FOUND TREASURE MINING COMPANY.—Some ore, taken from above the 100-foot level of old works, has been shipped to the reduction works.

NEVADA QUEEN MINING COMPANY.—The shipment of bullion from this mine sent to San Francisco amounted to $18,400.

PONDERE MINING COMPANY.—The ledge is 5 feet wide and gives assays of both gold and silver. Shaft No. 2 will be sunk deeper before drifting. The ledge is getting stronger and shows some chloride ore.

### EUREKA COUNTY.

RICHMOND CONSOLIDATED MINING COMPANY.—The company's furnaces have closed down. They may not be started up again before next spring, but the company will continue to purchase custom ores the same as usual.

### STOREY COUNTY—COMSTOCK LODE.

We condense the following from the Virginia City *Chronicle:*

The following mines on the lode are now said to be controlled by Senator Jones, R. F. Morrow, and the Sharon estate: Yellow Jacket, Crown Point, Belcher, Overman, Knickerbocker, Caledonia, New York, Justice, and Silver Hill. Their accession to the control of the New York and Silver Hill will be followed by the resumption of operations in those mines on an extensive scale at an early date.

BULLION MINING COMPANY.—No decision has yet been arrived at by the management on the project of opening up the 1400 level of the mine, through the Ward shaft, to reach the ore development made in the east drift from the old shaft on that level.

CHOLLAR MINING COMPANY.—The new stamp-mill at the Chollar shaft and the hoisting-works are now illuminated with electric lights, the power for which is obtained from dynamos operated by water-power. The mill has started up crushing Potosi ore.

CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.—Daily ore shipments to the Eureka mill have been increased to 125 tons. With the crushing capacity now available, the ore output from the mine will average daily 600 tons, which should produce $105,000 in bullion per week with the average value of ore extracted milling $25 per ton.

KEYES MINING COMPANY.—Operations were to be resumed at this mine December 1st, which is now in the hands of prominent San Francisco capitalists, who have listed the stock at the Stock and Exchange Board. The indebtedness against the property is now satisfactorily adjusted, and its development will be energetically pro-ecuted.

WEST CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.—This company, recently organized in San Francisco, owns the old William Penn ground adjoining the west boundary of the Consolidated California & Virginia. The ground is patented and the owners hold a deed to the property from the Consolidated California & Virginia Mining Company. A shaft was sunk on the William Penn in the early history of the lode and a vein of ore developed at a depth of 200 feet below the surface, which showed an assay value above what is now termed the milling grade. The stock will be listed in the San Francisco Stock and Exchange Board. Col. S. T. Curtis is the superintendent of this property.

### WHITE PINE COUNTY.

ARGUS MINING COMPANY.—The case of Patnode against this company for $10,000 damages for alleged injuries sustained in the mine has been decided adversely to the plaintiff in the White Pine District Court.

OSCEOLA GRAVEL MINING COMPANY.—A condensed report on the Osceola gold placer, based upon the most careful and elaborate tests of the property by George W. Maynard, shows that the property is situated in White Pine County, Eastern Nevada, on the western flank of Mount Wheeler. It is 96 miles from Frisco, the present terminus of the Utah Central Railway. The projected railway to Los Angeles, Cal., to which we referred in our issue of October 1st, will, it is said, come within 5 miles of the property, which consists of 712 acres of gold-bearing gravel in one body, held by indisputable titles; exclusive water rights to six streams favorably situated for supplying water to wash the gravel; a ditch 16 miles long and a distributing reservoir for utilizing the water of said streams; one hundred and sixty eight acres of placer ground (auriferous gravel) on the line of the ditch, five miles from the present workings; 2560 acres of desert land below the great placer for depositing tailings. A Fraser & Chalmers 20-stamp mill of the best modern construction, which will be made available when the quartz veins above Osceola come to be worked; two ranches, covering 120 acres, of improved farming land for furnishing supplies. The ground in the great placer known to contain gold-bearing gravel is three miles long, of which 1½ miles are 3000 feet wide, and the remaining upper half over 1000 feet. The developments have proven the depth of the gravel to range from 45 feet in the channel in the upper part of the gulch to 265 feet half a mile below the present workings, with every evidence of increasing depth as the valley is approached. The average depth of gravel below the present workings may with confidence be estimated at 150 feet, which means 115,500,000 cubic yards. At 15 cents a cubic yard the gross value, therefore, amounts to $17,000,000. Up to August 31st, 1886, 125,892 cubic yards had been hydraulicked at one point known as the "Big Cut," yielding $29,715, equal to 23·6 cents per cubic yard, with an average of but 356 miners' inches of water for six to eight hours a day. With water for about 100 hours this season, over 600 ounces of gold, valued at $9700, have been cleaned up from the sluice and the bed-rock. The limited supply of water is due to the exceptionally dry season and the absence of storage reservoirs. In no one of the many shafts and prospect holes sunk for exploration has the ground been barren. In the line of the deep channels the average value of the gravel has been over twenty cents to the cubic yard. The richness of the gravel, ranging from $11 to $50 per cubic yard just above and on the rock bed, brings the property into the front rank of the richest California placers.

The prevalence of large nuggets is one of the most striking features of this property. Mr. Maynard has in his possession nuggets ranging in weight from 2 ounces to 72 ounces, and of an aggregate value of over $3,000, taken from the bed rock at and above the present workings—in estimating the value of the gravel he has not included the nuggets. The existing ditch, over 16 miles long, with the addition of reservoirs, may be counted on to deliver 521 miners' inches of water per day for seven months, and the propsed ditch, 2094 inches daily for the same period, making a total of 2615 inches. This is the lowest probable average based upon the last three years' experience; it would break down 10,460 cubic yards of gravel every twenty-four hours, which, at fifteen cents a cubic yard, would give a daily gross product of $1569 at a cost not to exceed $523, equivalent to a daily net profit of $1046, or $190,372 per year of seven working months as a minimum available for dividends. This figure may easily be increased to $225,000 by large supplies of water from melting snows in the months of May and June, which would make the average water supply for seven working months considerably exceed the quantity on which the above estimates were based. In twelve months after completing the work of dam and ditch building, the minimum net income of $190,000 may be confidently assured. Taking the present ditch as a basis of estimate, the new ditch of 22 miles may be built for $100,000, with a margin for unexpected contingencies. With an additional sum of $100,000 the dams and hydraulic appliances can be supplied. Over $100,000 have already been expended for the present ditch line and other permanent plant.

The full report, of which this is an abstract, shows not only that this is a very valuable property, but that it has been tested and sampled, we believe, more carefully and exhaustively than has before been done at any gravel mine in this country. The work reflects great credit on Professor Maynard.—ED. ENGINEERING AND MINING JOURNAL.

## NEW MEXICO.

### SANTA FE COUNTY.

ST. LOUIS AND NEW MEXICO MINING COMPANY.—This company, which owns extensive placer deposits in South Santa Fe County, is about to purchase a first-class artesian well plant, the same to be used in developing water for the working of these placers. The company has also under consideration the operating of a group of silver mines near Cerrillos, and the erection of a smelting plant there.

## OHIO.

### WOOD COUNTY.

The large oil-well in Cygnet, which caught fire one week ago, burned until November 30th, when the flames were extinguished. It is estimated that 350,000 barrels of oil have been consumed. It caught fire by sparks from a passing locomotive which ignited the gas and an explosion followed. The fire was extinguished with much difficulty, it being necessary to erect a huge crane, by means of which an immense cap was swung into position over the well, smothering the flames.

## PENNSYLVANIA.

### COAL.

The new breaker, owned by F. C. Dinney, at Pittston, known as the Dininny breaker, was blown down by the high wind on the 28th ult. The building was ready for the roof, and the work of putting in the machinery had been begun. It was 174 feet high at the highest point, and covered nearly an acre of ground. The rebuilding will be done at once.

BLUBAKER COAL COMPANY.—A charter has been granted to this company, which has a capital of $500,000. The officers are: Abraham Hess, of Lebanon, President; J. L. Spangler, Bellefonte, Secretary; W. F. Reeder, D. H. Hastings, Gilbert R. Beaver, Bellefonte; Robert H. Coleman, Cornwall. The coal lands are in Cambria County.

BOLIVAR COAL AND COKE COMPANY.—The first block of 50 ovens in the 300 oven plant of this company at Lockport, Westmoreland County, was fired November 26th. Another block of 100 ovens will be fired at the end of this week. The 150 ovens will yield an average product of 15 cars per day. The company claims the coke of this section of Westmoreland County to be richer in carbon and very much lower in ash than the average Connellsville product. It also claims economy in production, as the coal is brought down to the ovens by gravity through chutes, and the drainage and dip of the coal is all in favor of the drift, 100 feet above the railroad track. The Conemaugh River gives a limitless supply of water. The wages paid the cokers will be on the same basis as those paid in the Connellsville region.

### NATURAL GAS.

BADEN NATURAL GAS COMPANY.—A meeting of the creditors of this company was held in Pittsburg on the 29th ult., to decide upon the future of the organization. A committee was appointed to consider a plan for an amicable compromise of the company's difficulties, to which we referred in our issue of November 19th, and a reorganization of the company.

BRIDGEWATER NATURAL GAS COMPANY.—This company sunk a test well at Aliquippa station, on the Pittsburg & Lake Erie Railroad, and last week struck a very strong vein of gas. A singular circumstance connected with this strike is that the Citizens' Gas Company sunk a well not more than 200 feet away from the Bridgewater Company's venture, and abandoned it as a perfectly "dry hole" after penetrating the earth to a greater depth than that at which the latter got the gas vein.

### OIL.

Exports of refined, crude, and naphtha from the following ports, from January 1st to November 26th:

| | 1887. Gallons. | 1886. Gallons. |
|---|---|---|
| From Boston | 3,675,850 | 5,266,642 |
| Philadelphia | 149,645,750 | 138,361,181 |
| Baltimore | 7,119,851 | 14,208,859 |
| Perth Amboy | 15,405,727 | 5,648,102 |
| New York | 339,637,302 | 358,045,652 |
| Total exports | 515,484,480 | 521,530,436 |

The monthly oil report published in the oil country districts on the 1st inst. shows a general decrease in work all over the region, and states there is a local increase in the Butler district, incident to the development of the "gusher" pool at Saxonburg, but even there, with more wells finished at that point, the new production is much smaller than last month. The three big wells which figured in the report of that district for October

were producing twice as much oil on November 1st as the fifteen completed this month will be producing to-morrow. At all other points the shut down movement to which we referred in our issue of November 5th has proven effective, and popular sentiment is daily growing more favorable to it. It is believed by competent field men that next month's report will show a greater decrease than this month's, as the new rigs account in the present report shows the greatest decrease, indicating that the active operations for the month were largely in the finishing of work already begun or at least laid out when the shut down went into effect on November 1st. The shut in of production has exceeded expectations and producers show more firmness in this course now than at the beginning of the term covered by the agreement. The total depletion of stock in the region for the month will be about 1,300,000 barrels, and the ensuing months are likely to show a greater decrease because of the decline in the production of persons outside of the shut-down agreement. It is certain that when the wells wholly or partly shut in are opened again at the end of the year they will not produce more than two thirds the amount produced before the shutting-in.

The summary of wells completed is as follows: November—Wells finished, 111; average daily new production, 1613 barrels; dry holes, 47. This is a decrease as compared with October, of two wells and 838 barrels of new production and an increase of fifteen in the number of unprofitable ventures. The summary of operations follows: November, new rigs, 50; wells drilling, 125; decline, 2; total work, 175.

## SOUTH AMERICA.

### ARGENTINE REPUBLIC.

Advices from Buenos Ayres state that all the export duties imposed by the Argentine Republic will be abolished on January 1st, 1888.

## SOUTH CAROLINA.

A bill was introduced in the Legislature, November 28th, to abolish all taxes on real and personal property. The proposition is for the State to repeal all privileges to dredge phosphate rocks in navigable waters, for which miners now pay a royalty of $1 a ton, and to undertake the work of mining of phosphate and the manufacture of fertilizers through a commission appointed for the purpose.

Another report says: Prices have gone down so by competition between land and marine companies that there is some danger of a general collapse. The State receives about $200,000 annually on royalty. A commission was appointed to investigate and report a plan to protect the State's interests. The commission was said to have agreed to report a bill leasing its interest to five big companies for not less than $200,000 per annum and to revoke all special licenses now held by a number of small miners. If this be done the syndicate will have control of the production and a rise in the price of rock is expected. The export of rock last year amounted to over 208,000 tons.

## UTAH.

### SUMMIT COUNTY.

CRESCENT MINING COMPANY.—Sinking in the mammoth incline shaft has been resumed. The winze is now down nearly 200 feet, and the ore-body is increasing in size and richness. Drifting on the vein from the first level will soon be commenced.

SAMPSON MINING COMPANY.—The connection from the main workings through the winze to the drain tunnel is practically completed. At present, to avoid flooding and damage in the tunnel, the water is being pumped out of the bottom of the incline shaft. A large amount of stoping ground is now open for exploration. The Park City *Record* says that the Sampson will hereafter be in a position to save about $70 a day for pumping, and besides the cost of hoisting ore and waste will be materially lessened by resorting to the advantages offered by the tunnel. From now on, the Sampson being practically free from many discouraging drawbacks, ought to make a splendid showing as an ore-producer on a large scale.

SOUTHERN TIER MINING COMPANY.—In a few weeks the east-side tunnel of the Southern Tier (Hayt) will have been connected with the old workings, and then there will be a freer circulation of air, and much more stoping ground will be opened up for exploration.

## VERMONT.

### RUTLAND COUNTY.

Parties who have been mining iron and manganese in South Wallingford for several months past have, it is stated, struck, at a depth of 600 feet, the most extensive deposit of Bessemer iron ore ever found in that section.

# COAL TRADE REVIEW.

NEW YORK, Friday Evening, Dec. 2.

## Statistics.

**Production Anthracite Coal** for week ended November 26th, and year from January 1st:

| TONS OF 2240 LBS. | 1887. Week. | 1887. Year | 1886. Year |
|---|---|---|---|
| P. & Read. RR. Co.. | 171,413 | 6,832,347 | 10,498,049 |
| Cent. R. R. of N. J. | 84,694 | 4,394,712 | * |
| L. V. RR. Co..... | 113,311 | 5,478,372 | 5,593,981 |
| D., L. & W. RR. Co. | 160,570 | 5,431,359 | 4,606,642 |
| D. & H. Canal Co.. | 102,760 | 3,593,548 | 3,228,910 |
| Penna. RR..... | 46,143 | 3,305,447 | 3,075,790 |
| Penna. Coal Co..... | 40,428 | 1,431,475 | 1,374,119 |
| Penna. Canal Co... | 10,049 | 478,354 | 470,951 |
| N. Y., L. E. & W. RR..... | ..... | †628,935 | †595,507 |
| Total..... | 729,368 | 31,577,540 | 28,440,949 |
| Increase..... | 97,135 | 2,136,600 | ..... |
| Decrease..... | ..... | ..... | ..... |

* Included in tonnage of Philadelphia & Reading RR.
† Tonnage to November 1st.
The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent of the whole production.

Production for corresponding period:

| | | | |
|---|---|---|---|
| 1882..... | 26,980,664 | 1884..... | 28,327,931 |
| 1883..... | 26,169,265 | 1885..... | 28,361,456 |

**Production Bituminous Coal** for week ended November 26th, and year from January 1st:
Tons of 2000 pounds, unless otherwise designated.

EASTERN AND NORTHERN SHIPMENTS.

| | 1887. Week. | 1887. Year. | 1886. Year. |
|---|---|---|---|
| Phila. & Erie RR..... | 780 | 20,257 | 16,724 |
| *Cumberland, Md.... | 81,588 | 2,954,069 | 2,290,435 |
| *Barclay, Pa..... | 3,196 | 164,150 | 163,566 |
| *Broad Top, Pa.* | | | |
| H. & Broad Top.. RR. | 6,942 | 311,360 | 345,428 |
| *Clearfield Region, Pa.* | | | |
| Snow Shoe ..... | 3,082 | 146,785 | 98,068 |
| Karthaus (Keating).. | 5,111 | 173,935 | 130,217 |
| Tyrone & Clearfield.. | 66,767 | 2,871,567 | 1,994,428 |
| Tipton..... | 258 | 14,639 | ..... |
| *Alleghany Region, Pa.* | | | |
| Gallitzin & Mountain. | 19,021 | 847,975 | 612,690 |
| *Pocahontas Flat Top Coal.* | | | |
| Norf'k & West. RR.. | 26,605 | 1,033,230 | 780,666 |
| *Kanawha Region, W. Va.* | | | |
| Ches. & Ohio RR.... | ‡ | †1,435,567 | †1,115,750 |
| Total..... | 213,350 | 9,973,534 | 7,547,972 |

* Tons of 2240 lbs. † Estimated. ‡ Report not received.

WESTERN SHIPMENTS.

| | | | |
|---|---|---|---|
| *Pittsburg Region, Pa.* | | | |
| West Penn RR..... | 6,182 | 274,929 | 288,141 |
| Southwest Penn. RR.. | 1,964 | 106,046 | 140,114 |
| Pennsylvania RR.... | 4,115 | 188,806 | 254,117 |
| *Westmoreland Region, Pa.* | | | |
| Pennsylvania RR..... | 37,930 | 1,441,156 | 1,144,961 |
| *Monongahela Region, Pa.* | | | |
| Pennsylvania RR..... | 12,658 | 388,368 | 365,265 |
| Total..... | 62,849 | 2,399,305 | 2,192,598 |
| Grand total..... | 276,199 | 12,372,839 | 9,740,570 |

**Production of Coke** on line of Pennsylvania RR. for week ended November 26th, and year from January 1st.
Tons of 2000 pounds.

| | 1887. Week. | 1887. Year. | 1886. Year. |
|---|---|---|---|
| Tyrone & Clearfield.. | .... | 1,750 | ..... |
| Allegnany Region ... | 6,362 | 228,820 | 176,451 |
| West Penn. RR..... | 1,770 | 99,577 | 98,354 |
| Southwest Penn.RR . | 62,632 | 2,574,646 | 2,455,818 |
| Penn. & W. Region.. | 11,511 | 331,384 | 301,054 |
| Monongahela..... | 2,424 | 109,222 | 131,242 |
| Pittsburg Region.... | .... | 38 | 108 |
| Snow-Shoe..... ... | 2,004 | 50,205 | 25,448 |
| Total..... | 86,703 | 3,395,642 | 3,188,475 |

## Anthracite.

This market is very decidedly quieter, and coal is obtained more easily, and at lower prices than two weeks or even one week ago.

The fancy prices that have recently been obtained for coal, and especially for Lehigh coal, have had to be reduced from 50 cents to $1 a ton. The companies nominal prices have not been changed, for they were always considerably below the figures at which coal could have been obtained.

These prices for free burning coals f.o.b. at shipping ports are still quoted: Broken, $4; Egg, $4.25 @$4.30; Stove and Egg, $4.75; Pea, $3@$3.10; Buckwheat, $2.25@$2.50, with the usual 15 cents commission off to the recognized middle men. The price asked for Lehigh Broken is $5; Egg, $5.25; Stove, $5.25; Nut, $5.50; Pea, $2.85.

Another advance of 15 cents a ton has been ordered by the Lehigh Valley railroad from the mines to Perth Amboy, to come in force December 12th.

The sales agents had a very harmonious and agreeable meeting this week, and were of one mind as to the cheerful outlook for the trade. It was generally thought that there will be an active demand and good prices through the next few months, probably up to the end of February, and it was generally thought that next year will see the output attain 36,000,000 tons.

The Lackawanna Company is evidently "making a fighting record" of 30,000 tons a day, which will be exhibited when the time comes a year hence to fight over the division of the trade. Events are evidently traveling the road, often predicted in these pages, when the large fish will swallow the small, and the entire anthracite coal trade will be in the hands or under the control of perhaps two companies, let us say the Pennsylvania Railroad and the Delaware, Lackawanna & Western. The next period of depression—may it be further distant than seems probable—may be the time when this concentration may take place, and perhaps the Knights of Labor may, to their cost, hasten its arrival.

There is nothing new in the Lehigh. It is said that the Knights are putting another turn of the screw on the Reading, and are asking a further advance of 4 per cent, or 12 per cent above the basis for the next four months at least, and every one supposes Mr. Corbin will have to grant it, a strike being out of the question until the public has absorbed the bonds and stocks at high prices, and that the Drexel Morgan Syndicate has fully harvested the $1,000,000, it is reported it will receive for carrying through the reorganization the company itself should and would have done had Mr. Gowen's advice been followed. Now, every one in the trade (except those who have to use coal) is happy, and no one wants to hear of anything but the bright future.

From Boston we hear that the demand has dropped off perceptibly, and more coal is coming forward on old orders. Of late all the coal was going on new orders to get the benefit of high prices.

The Connecticut River is reported closed by ice, according to its custom, on December 1st.

## Bituminous.

There is nothing new in this market. Spot coal is perhaps a little easier to get, and it is said that some Beach Creek coal can still be purchased at $3.25, but the Standard Clearfield companies are firm at $3.50, and Cumberland is held even higher. There will be no change in these prices before April next, and it is probable that all these interests may yet and before long follow the example of nearly every other business in this country and enter a "trust." Every thing appears tending toward *trusts*, but it requires no prophet to foresee what end this peculiar phase of political economy is leading to.

### Baltimore. Dec. 1.

The following price in cars on track, or in dealer's yards to trade are reported from Baltimore: Hard White Ash, Broken, $4.85; Egg, $5; Stove, $5; Chestnut, $5; Pea, $3.10; Buckwheat, $2.70; Shamokin: Egg, $5.25; Stove, $5.25; Chestnut, $5; Pea, $3.10; Buckwheat, $2.70. Lykens Valley: Broken, $4.75; Egg, $5.40; Stove, $5.55; Chestnut, $5.25; Pea, $3.60. Afloat alongside, by cargo, fifteen cents less than by cars.

### Boston. Dec. 1.

[From our Special Correspondent.]

There is not enough coal for sale to make any kind of an anthracite market at this port. There would be a big demand for spot coal, or coal afloat if any one had any. It is hard, and in fact next to impossible to get stove coal in New York for immediate shipment, though $5.50 would be readily paid and perhaps more, and say $5.25 for egg. Dealers can find what the market is only by making a personal hunt. Broken coal is in better supply than stove and egg and has been for some time, but the supply of this size is being reduced. Broken is nominally quoted at $4.25 f.o.b. at New York. Pea coal is quoted at $2.50@$2.75 and Buckwheat at $2@$2.25 f.o.b. Those best posted in the trade here anticipate no decline for at least three weeks. About January 1st it is thought that coal will begin to accumulate somewhat. As long as the local dealers can not get quick despatch, they are out of the market, unless pressed by emergency, as about every one has put in all the orders they care to give for delivery in the uncertain future.

There is nothing new in bituminous coal from last week's report. There is great difficulty in getting coal along that has been ordered a long time, and fresh orders fare poorly. Most shippers are asking an advance, and $2.60 is as low a f.o.b. price as I have heard; $2.75 is more commonly asked. There is coal enough, but transportation facilities both by rail and water are insufficient.

Freight rates remain very high from a twofold cause; vessels are beginning to be scarce on account of the season, and longer time occupied in running, and again so much detention is caused that demurrage has to be paid or its equivalent in freight rates. It looks now as if rates were up to stay at about present figures, at least, but detention charges may be less.

We quote exclusive of discharging: New York, $1.50; Philadelphia, $1.75@$1.90; Baltimore, $1.90; Hampton Roads, $1.75.

There is a good retail trade, and prices are firmly maintained. Notwithstanding the recent advances, coal could not be replaced and sold at a profit at present prices.

Delivered prices are: Stove, $7; Nut, $7; Egg, $6.75; Broken, $6.50; Lykens Valley, $8.55; Lehigh Egg, $7; Broken, $6.75. Wharf prices, 50 cents less per ton.

### Buffalo. Dec. 1.

[From our Special Correspondent.]

The Erie and other State canals were closed for the season at noon to-day. No boats were detained by reason of navigation being obstructed by ice, as far as heard from.

Numerous disasters reported from all points on the lakes during the past week. The aggregate damage for the season will be very large, accompanied with a large death roll. About 600 tons of coal were lost a few days since by the sinking of the schooner White Star on Lake Erie, bound from Oswego to Detroit.

Navigation is about closed at all Lake Superior ports; weather intensely cold, thermometer below zero. Latest arrivals report vessels covered with ice. At this port vessels are still leaving, but the bulk of the late arrivals are now being stripped for going into winter quarters. "Coal is wanted for Western ports for several vessels, but there is none here to ship," said a broker yesterday. "The chutes are cleaned out entirely, as neat as a newly swept parlor."

News comes from near-by local and Western New York points, as well as from many parts of the West and Northwest, of the great scarcity of coal and the urgent necessity of some arrangement being made by which supplies can be obtained. Here is a specimen Western item: "The announcement comes from Duluth that nearly 1,000,000 tons of coal have been taken there—over 200,000 more than last year—and yet it is already evident that there will be a great shortage in the supply this winter. The first blizzard has come. The towns of Western Minnesota and Eastern Dakota are showing signs of great anxiety. At Huron many people are preparing to bring bay burners into requisition. At Adrian there is not a pound of coal for sale, and some distress is reported among the poor."

A man living 20 miles from here says: "We have a coal famine and can not buy any for love or money. When we ask the agents of the railroad passing through our place, who sells the coal, what is the reason why we can not get it, he answers that he sent his orders months ago to the coal companies, but it does not come." Scarcity of cars is deemed to be only a partial explanation of the trouble

The three electric light companies of this city united on price and bid 47½c. per lamp per night (sunset to sunrise); three gas companies did the same thing and bid $1.35 for 1000 cubic feet to the city and $1.40 to private consumers. Finding no way to obtain action against the combinations, the bids were accepted. These figures show a reduction of 2½c. for each electric light and 5c. per 1000 feet of gas.

In consequence of the urgent demands for lake tonnage, $1.50 per net ton was paid for coal to Milwaukee and Chicago since Friday last; the closing rate of 1886 was $1.50 and of 1885 $1.25. The going rates for the last week of November were $1@$1.50 to Chicago and Milwaukee, and 50c. to Toledo, Detroit, and Cleveland.

The shipments of coal westward by lake from November 23d to 30th, both days inclusive, were 46,800 net tons, namely: 34,800 to Chicago, 7500 to Milwaukee, 1100 to Detroit, 2400 to Toledo, and 1200 to Cleveland; total for the season, including vessels from Tonawanda which load here without reporting at the Custom-House, 1,902,560 net tons, as compared with 1,588,900 tons in 1886, and 1,495,510 tons in 1885.

Next week will send you final statements of the lake and canal movement of coal for the season and other items of interest.

No changes made in quotations for coal to-day as far as heard from, but a rumor is in circulation that a reduction in prices may be expected. This rumor, it is believed, has reference to New York figures, not Buffalo.

### Pittsburg. Dec. 1.

[From our Special Correspondent.]

COAL.—The coal question is becoming a very serious one, not only to river towns, but also at other points. Unless a supply of Pittsburg coal can be obtained, darkness will be the result, as there is no coal to make gas. The want of cars is the principal drawback. Coal market firm everywhere, prices advancing. Retail prices Cincinnati and Louisville just what holders choose to ask.

PRICE OF COAL PER 100 BUSHELS.

| | | | |
|---|---|---|---|
| First pool | $4.75 | Fourth pool | $3.25 |
| Second pool | 4.25 | Railroad coal | $5.00@5.25 |
| Third pool | 3.75 | | |

CONNELLSVILLE COKE.—Demand fair, cars very scarce. Stocks in yard accumulating. Prices are: Blast furnace, f.o.b., $2 per ton; Foundry, $2.30; Crushed, $2.60.

A small rise in the Allegheny River enabled dealers to send out a few flat loaded with coal, containing 140,000 bushels.

A meeting of independent coke producers with the four leading coke firms was held at Pittsburg on the 30th ult., in which the state of the trade was fully discussed. The producers demanded whether the syndicate firms would purchase their coke or should they seek a market for themselves. The reply was that the firms in question would make individual contracts with producers under the same conditions as the syndicate formerly gave, and would carry out those principles in the same manner. Contracts were signed at once by J. M. Schoonmaker & Co., H. C. Frick & Co., McClure & Co., and the Connellsville Coke and Iron Company with the various producers, and business will proceed on the old basis.

## FREIGHTS.

The latest actual charters to December 2d, per ton of 2240 pounds:

**From Baltimore to:**—Bath, 1.60; Boston, 1.60; Bridgeport, 1.45; Bristol, 1.50; Brooklyn, 1.30; Charleston, 80@1.00; Fall River, 1.45; Galveston, 3.00; New Bedford, 1.45; Newburyport, 1.85; New Haven, 1.45; New London, 1.45; New York, 1.30; Portland, 1.60; Portsmouth, N. H., 1.70; Providence, 1.45; Salem, 1.60; Savannah, 1.25; Somerset, 1.45; Williamsburg, N. Y., 1.30; Wilmington, 1.00. Freights firm.

**From Philadelphia to:**—Alexandria, 1.05; Bath, Me., 1.85*; Boston, 1.60@1.75*; Chelsea, 1.75*; Galveston, 3.00; Gloucester, 1.75*; Lynn, 1.65; New York, 90§; Portsmouth, Va., 65; Portsmouth, N. H., 1.90*; Richmond, Va., 85; Washington, 60§.

**From New York to:**—Boston, 1.50@1.60*; Bridgeport, Conn., 75; Bristol, 90; Cambridge, Mass., 1.10*3c.; Cambridgeport, Mass., 1.10*3c.; Charlestown, $1.10*; Chelsea, 1.10*; Com. Pt., Mass., 1.10*; E. Boston, 1.10*; E. Greenwich, R. I., 1.00; Fall River, 1.00; New Bedford, 1.00; Newburyport, 1.25*; New Haven, 80; Newport, 90; Norwich, 90; Portland, 1.10*; Portsmouth, N. H., 1.20*; Providence, 1.00; Salem, 1.10*; Somerset, 1.00.

* And discharging. † And discharging and towing. 3c. per bridge extra. § Alongside. ‖ And towing up and down. ¶ And towing. †† Pilotage. ** Below bridge. * Old B. I.

## MARKETS.

NEW YORK, Friday Evening, Dec. 2.

**Prices of Silver per ounce troy.**

| Nov. | Sterling exchange | Lond'n Pence. | N. Y. Cents | Nov. | Sterling exchange | Lond'n Pence. | N. Y. Cents |
|---|---|---|---|---|---|---|---|
| 26 | 4.85 | * | 95 | 30 | 4.85 | ‡ | 95⅛ |
| 28 | 4.85 | 43⅞ | 95 | ‡ | 4.85 | 43⅞ | 95 |
| 29 | 4.85 | † | 95⅛ | 2 | 4.85 | * | 95 |

* 43 13-16. † 43 15-16. ‡ Dec. 1.

The metal market is in a most excited condition. The successful boom given to tin some time ago was followed by antimony, copper, spelter, lead and quicksilver, each of which has advanced enormously. The question asked everywhere is, of course, "How long will this last and how high will the market go?" and to this is added, "What will be the next metal to feel the boom?" Will silver be taken up and manipulated as have the other metals? No intimation of this is yet given, but it need not surprise any one if it were to happen.

Though we are pleased to be able to record the higher prices which will add greatly to the prosperity of the mining and metallurgical industries, we fear the present boom has been too rapid to be healthy, and too much confidence in its future should not be rashly indulged in.

*Coinage at the United States Mint.*—The total coinage of the United States mints during November was 13,614,400 pieces, valued at $7,297,290, and included 173,000 double eagles, 3,400,000 standard silver dollars, 2,670,000 dimes, 2,414,400 five-cent pieces and 4,157,000 one-cent pieces.

*Foreign Bank Statements.*—The governors of the Bank of England at their weekly meeting made no change in its rate for discount, and it remains at 4 per cent. During the week, the bank gained £77,000 bullion, but the proportion of its reserve to its liabilities was lowered from 48·23 to 48·04 per cent, against a reduction of 44 11/16 to 44⅛ per cent in the same week of last year. The weekly statement of the Bank of France shows a decrease of 3,225,000 francs gold and a gain of 675,000 francs silver.

**Copper.**—The boom in metals has made further progress during the past week, and nearly the entire list of the principal metals has now shared in the improvement in prices. The movement is conducted by a powerful combination in Europe, who have managed the whole business in a very skillful manner. Chili bars were first of all driven up to a price which could not have been anticipated, and we had again a repetition of the state of affairs which was brought about in 1873, when consumers copper was considerably cheaper than the more speculative Chili bars. This peculiar condition of things has now, however, nearly disappeared, and during the last few days a large amount of business has been done in all the finer grades of copper, which are found to be getting rather scarce. Chili Bars, which closed last week at £57 15s. cash, ranged on Monday from £61 to £62 15s.; on Tuesday from £64 10s. to £63 15s., and on Wednesday £67 was touched, but after some fluctuations prices fell somewhat and again rose to £66 15s. On Thursday the price opened at £66 5s. and closed at £67, and on to-day, Friday, the opening price was £67 10s. cash, and the closing price £67 17s. 6d. sharp cash.

On the New York Metal Exchange the business to a large extent followed the same course as London, and the price of Lake copper, which closed at 14c. last Saturday, rose gradually from the beginning of this week to 15¼ spot on Thursday, whilst to-day the market closes very firm at 15·60 to 15·70c. spot, 15·90c. to 16c. January, 16·05 to 16·10c. February, 16·15 to 16·20c. March, 16·25 to 16·30c. April, whilst May sold at 15·30 to 15·35c.

During the past week a very heavy trade has again been done, and it is understood that a large quantity of Lake ingot copper is now being shipped to Europe.

Messrs. Henry R. Merton & Co., of London, cable the statistics for the second half of November as showing a decrease of 2800 tons.

In the face of the existing speculative forces it is of little use to discuss the inherent strength or weakness of the market, but we would again take the opportunity of advising all parties concerned to operate with the greatest caution.

We are able to announce in the most positive manner that the negotiations which were commenced, but had not, it is true, advanced to any thing like definite figures, for the combination of the great European and American producers, has now been dropped altogether for the present: in fact, the present condition of the market is not such as to encourage any united action.

English smelters are anxious to purchase furnace material, and would willingly contract up to April or May.

The following table gives the exports of copper from this port since our last report, published on November 5th, and up to November 20th. Next week we shall bring it up to date. The omission was from unavoidable causes.

The exports of copper from November 5th to 20th were as follows:

| | Bags. | Lbs. | |
|---|---|---|---|
| To Hamburg— | | | |
| By S.S. Polaria—Matte | 204 | 31,200 | $1,100 |
| " Rhartia—Bullion | .... | 818 | 1,700 |
| " " —Copper Bars | .... | 67,757 | 6,800 |
| To Havre— | Bars. | | |
| By S.S. Austria—Arg. Cop | 676 | 91,800 | 14,000 |
| " " —Copper | Bbls. 45 | 65,600 | 5,600 |

COPPER.

| To Liverpool— | Bars. | Lbs. | |
|---|---|---|---|
| Oct. 31—Kepler—Copper | 1,037 | 228,677 | 25,000 |
| Nov. 12—Ohio—Copper | 822 | 56,000 | 5,400 |
| Nov. 7—Hermann—Antwerp | 83 | 31,026 | 2,800 |

MATTE.

| | Bags. | Lbs. | |
|---|---|---|---|
| Oct. 31—The Queen | 3,402 | 367,420 | $18,500 |
| Adriatic | 4,425 | 486,260 | 22,500 |
| Alaska | 5,687 | 675,344 | 33,768 |
| Nov. 1—Britannic | 4,146 | 468,310 | 24,000 |
| 4—City of Richmond | 5,003 | 570,970 | 28,600 |
| 11—Wyoming | 194 | 21,654 | 1,200 |
| | 4,209 | 491,090 | 25,000 |
| 7—Celtic | 4,053 | 482,130 | 25,000 |
| 11—England | 6,283 | 726,605 | 37,000 |
| | 3,643 | 452,480 | 35,000 |
| 12—Ohio | 4,010 | 472,450 | 24,000 |
| 14—Arizona | 6,050 | 706,530 | 36,000 |
| 15—Germanic | 4,192 | 483,430 | 25,000 |
| 18—Egypt | 7,859 | 932,530 | 45,000 |

Elsewhere we give the latest and fullest information concerning the Calumet & Hecla fire.

**Tin.**—For the second half of November the statistics of stocks show here an increase of 1300 tons, but nevertheless prices have risen daily without any interruption, and the London market, which last week closed at £151, is to-day £165 cash, while for three months forward tin is sold at as much as £25@£30 per ton below spot price. This fact alone sufficiently indicates the present unhealthy condition of the market, under which consumers must of course suffer. In New York prices have risen from 33c. last Saturday to 34·50@34·80c. for spot, and 32@32½c. for futures.

**Lead.**—It is evident that the highly successful operations in tin and copper have now encouraged the manipulation of lead, and as was the case with tin and copper, London has taken the initative in this movement. Last week the closing price in London for Spanish lead was £12 15s., and it is reported to-day at £15 5s.@£15 10s., with buyers over. English lead is obtainable at about the same price, but there appears to be but little offering. The works in Germany are mostly out of the market, having sold their output for months to come, and we hear that almost the entire production is absorbed for home consumption.

In our market, prices have risen from 4·50 to 5⅛@5¼c. spot, and although considerable quantities have been put on the market by producers who wanted to take advantage of the rise, every lot offered found eager buyers.

We attribute the improvement almost entirely to the speculative feeling, which has also shown itself in the other metals, as it is scarcely warranted by the *bona fide* consumptive demand.

Sales during the week have aggregated between 1500 and 1800 tons of actual lead, not mere stock exchange margins, and the market is so excited a still higher price may yet be reached. The fact that there are no stocks of any account in this country, and that the consumptive demand has absorbed not only the domestic production, but about 2000 or 2500 tons of foreign lead this year, offered an excellent foundation for speculation, which the success of the tin and copper corners naturally encouraged. There is no such urgent demand from consumers as to indicate any absolute want. The Richmond sale last week was 320 tons.

Messrs. John Wahl & Co., of St. Louis, telegraph to day as follows:

Lead during the week now ending has ruled active and strong, and records an advance unequaled in such periods for long time demand, both speculative and consumptive. Sales for the week sum up 1500 tons at prices ranging from 4·25@4·60c., and at the close the situation is too excited to give an accurate report. All available lots have been absorbed, and no lead is obtainable below 4·75c.

Messrs. Everett & Post, of Chicago, telegraph today as follows:

The week opened at 4·30c. under advices from Europe of a large syndicate and rise in values to £15 in London, and the absorption of meager stocks East and West. The market is rising, excited, and unsteady, and it is difficult to give exact quotations. Sales have been made at 4·55c., 4·60c., and 4·65c., closing at 4·80c.

**Spelter.**—Although there is little life in this article, prices have gradually improved and we have now to quote Domestic at about 5@5⅛ cents. Some rumors have been current that large quantities of Spelter had been bought up in the West, and the quantity mentioned was about 27,000 tons, but so far we have been unable to verify these reports. Considering that prices have again advanced in England, and that for some years past the low prices ruling allowed little or no profit to producers, it would seem that this article is now in a very sound position. The quotations in London are now for ordinaries £17 to £17 2s. 6d. for Specials, £17 5s. to £17 7s. 6d and there appears to be a great scarcity of spot supplies. Importers here have put up their prices for W. H. Spelter to 5¾@5¾c., and even at these prices very little is offered.

*Sheet Zinc* is still quoted 6¾@7c.

**Antimony** has been very active and in good demand. The English smelters have again advanced their prices, and to-day the quotations are 9¾@10c. for Cookson's, and 9¼@9½c. for Hallet's.

**Quicksilver** has risen in England from £7 15s. last week to £10 10s., and prices have also advanced here.

**Nickel** remains in a satisfactory position, with quotations unaltered at 65c.

**Chemicals.**—The chemical trade remains practically unchanged since our last report. Caustic soda is dull at $2.33, and purchasers in this as in most other articles are holding off until after the New Year in order to make as good a financial showing as possible at the close of the year. Caustic is selling at $2.33 per 100 pounds, and sal soda is also somewhat weaker since our last report, and is being imported at from 95 cents to $1 per 100 pounds.

From England our correspondents write that there are no new features to report, the chemical market being firm and tolerably active. Caustic soda is in demand for both spot and forward delivery at £6 2s. 6d. for 60 per cent; £7 5s. for 70 per cent, and £8 2s. 6d.@£8 5s. for 74 per cent, best brands. Sal soda is weaker this week, and is selling at £2 10s.@£2 15s. for best make, and sulphate or salt cake is neglected.

There is no change in acids. The market is dull at our quotations. Nitrate continues at 2¼c. We refer to our weekly register of current quotations for prices.

THE PRICE OF MURIATE OF POTASSIUM.—According to a circular of the sale syndicate for muriate of potassium, the price for those orders for 1888, which come in previous to the 10th of next December, is fixed at 6·70 mks per centner, while on later orders the price will be 6·80 mks per centner.

WEEKLY REGISTER OF

## CURRENT QUOTATIONS.

This list is the result of careful compilation and is destined to meet the demands of all classes of subscribers. The prices quoted are those actually ruling in our own and foreign markets. Manufacturers and importers will please give notice of all modifications not later than Friday noon each week.

### CHEMICALS.

**Acid**—Sulphuric, 60°, per 100 lbs.. 80
Sulphuric, 66°, per 100 lbs .. .... 90
Hydrofluoric, per 100 lbs'.... .... 95
Muriatic, 18°, per 100 lbs .... .... 1.15
Muriatic, 20°, per 100 lbs.... . . 1.25
Nitric, 36°, per 100 lbs ..... 4.00
Nitric, 42°, per 100 lbs.... .. .... 6.00
**Alkali**—36 p. c ..... ..... .. 1.10
Refined, 58°..... .... ..... 1.15
**Alum**—Lump, per lb..... ..... 1¾
Ground, per lb ..... 2
Lump. per ton, Liverpool .... ... £5
Sulphate of Alumina .....£4 12 0
**Aluminum**—(Metallic), per lb...12.00
**Ammonia**—Sulph., per 100 lbs.. 3.00
Carb., per lb..... 7¾
Muriate, per lb... ..... 7
**Antimony**—Hallet's, per lb..... 8¼
Cookson's, per lb ..... ..... 9¼
**Arsenic**—Metallic, per lb..... 32
White, powdered, per lb..... 2¾
White, glass,. ..... . ..
Red. per lb..... .. .. 6½
White, at Plymouth, per ton. .£21 0 0
**Asbestos**—American, p. ton.....20 00
Italian, p. ton, c. i. f. L'pool ...£18 0 0
**Asphaltum**—P. ton .....13.00
Prime Cuban, ₱ lb .. ..... 5@6c.
Hard, ₱ ton..... .... ..... $28.00
Trinidad, refined, ₱ lton ..... $30.00
**Barium**—(Metallic), per lb.....975.00
**Barytes**—Sulph., Am. prime white16.00
Sulph., foreign, floated, p. ton....19.00
Sulph., off color, p. ton .....12.50
Carb., lump, f.o.b. L'pool, ton £6 0 0
No. 1, casks, Runcorn " "£4 10 10
No. 2, bags, Runcorn " " 3 15 0
**Bismuth**—(Metallic), per lb..... 2.40
**Bleach**—Over 35 p. c., per lb..... 2¼
**Borax**—Per lb ..... 6¼
Refined at Liverpool, per ton..£26 10 0
**Bricks**—Pale, per 1,000 ..... 5.00
Jerseys, per 1,000 .. ..... 7.50
Haverstraw, per 1,000 ..... .... 8.50
Front bricks, per 1,000, from.....10.00
**Brimstone**—*See Sulphur.*
**Bromine**—Per lb.... ..... 36
**Building Stone**—Amherst free-stone, per cu. ft., from.... .... 75
Brownstone, per cu. ft., from..... 1.00
Granite, rough, per cu. ft., from.. 45
**Cadmium**—(Metallic), per lb..... 1.45
**Calcium**—(Metallic), per oz.....150.00
**Cæsium**—(Metallic).....
**Cerium**—(Metallic), per oz..... 168
**Cement**—Rosendale, per bbl..... 1.00
Portland, American, per bbl..... .. 2.00
Portland, foreign, per bbl..... .... 2 25
**Chalk**—Per ton..... ..... .... ... 3.00
Precipitated, per lb..... 4
**China Clay**—English, per ton....18.50
Southern, per ton ..... .....13.50
**Chrome Yellow**—Per lb ..... 8
**Chromium**—(Metallic), per lb...200.00
**Cobalt**—(Metallic), per lb..... 7.00
**Cobalt**—Oxide, per lb..... ... 2.15
**Copper**—Sulph. English Wks.,ton£13 10 0
Precip., English Works, unit..fluctuating
**Copperas**—Common, per lb ....$ 70
Best, per lb..... .. .. 1.20
Liverpool, per ton, in casks, £2... 1.20
**Cream of Tartar**—Am. 99 p. c. lb 35
Powdered, 99 p c..... .. .. 36
**Didymium**—(Metallic), per oz ..160.00
**Emery**—Grain, per lb .. .... 3½
Flour, per lb .. ..... 2½
**Erbium**—(Metallic), per oz... ...140.00
**Feldspar**—Ground, per ton.. ....14.00
**Fuller's Earth**—Lump, per bbl. 95
Powdered, per lb.. ..... 2
**Gallium**—(Metallic), per oz ....3250.00
**Glucinum**—(Metallic) .....
**Green**—Emerald, per lb..... 25
Brunswick..... .. .....
**Gypsum**—Calcined, per bbl.. .... 1.25
**Indium**—(Metallic), per oz..... 158.00
**Iodine**—Resublimed..... 3.50
**Iridium**—(Metallic), per lb.....700.00
**Kainit**—Per ton..... .... ... 7.25
**Kaolin**—*See China Clay.*
**Lanthanum**—(Metallic), per oz.175.00
**Lead**—Red, per lb..... ..... 6
White, American, in oil, per lb.... 6½
White, English, per lb ..... 7½
Acetate, or sugar of..... 12
**Litharge**—Powdered, per lb..... 5½
English flake, per lb..... 9
**Lithium**—(Metallic), per oz.....160.00
**Magnesite**—Syrian, per ton.....15.00
**Magnesium**—Per lb.... ..... .. 4.00
**Mineral Wool**—Per lb ..... .. 2
**Mica**—
In sheets according to size, 1st quality, ₱ lb..... ..
In sheets according to size, 2d quality, ₱ lb..... .....
**Molybdenum**—(Metallic) per lb. 6.00
**Nickel**—(Metallic), per lb..... .....125.00
**Niobium**—(Metallic), per oz.....128.00
**Osmium**—(Metallic), per lb .... 640.00
**Palladium**—(Metallic), per lb...512.00
**Platinum**—(Metallic), per lb ..148.00
**Phosphate Rock**—S. Carolina, per ton f. o. b. Charleston..... 5.80
Ground, per ton f. o. b. New York.10.00
Canadian Apatite, lump, f. o. b. at shipping port, per unit..... 24
**Manganese**—lump, c. i. f. Liverpool, per ton.....£3 2 6
Per unit, up or down..... .....£0 1 3
Ground.... .....£6 0 0
Metallic, per lb ..... 1.10
**Mercury**—*See Quicksilver.*
**Mercuric-Chloride**—(*Corrosive Sublimate*) per lb..... 55
**Phosphorus**—Per lb..... 70
**Plumbago**—Ceylon, per lb..... . 4
American, per lb..... 7
London, per cwt ..... .....£0 15 0
**Potassium**—Metallic, per oz..... 2.00
Cyanide, per lb..... ... .....
Bromide, per lb..... ..... 37
Chlorate, per lb..... ... ..... 14
Carb. per lb. ..... 5
Caustic, per lb ..... 7½
Iodide..... ... ... ..... 2.10
Muriate, per 100 lbs..... 1.70
Nitrate, refined, per lb..... .... 6
Bichromate, per lb.... ..... 10½
Sulphate, per 100 lbs.. ... .. .. 1.10
Yellow Prussiate, per lb.... ..... 19
Red Prussiate, per lb... .. ..... 42
**Pumice Stone**—Select lumps, per lb.... ... ..... 2½
Original cks., per lb..... . ..... 1½
Powdered, pure, per lb... ..... 1¾
**Pyrites**—Non-cupreous, p. unit, s. 10
**Quartz**—Ground, per ton .....18.00
**Quicksilver**—Per lb.. .... . .68@70c.
London, per flask of 75 .... ....£10 10s.
**Rotten Stone**—Powdered, per lb. 8½
Lump, per lb... ..... 5
Eng., powdered, per ton ... ..... £4
Lump, per ton..... ..... £5
**Rhodium**—(Metallic), per lb....512.00
**Ruthenium**—(Metallic), per oz. 112.00
**Rubidium**—(Metallic), per oz...200.00
**Salt**—Liverpool, ground, per bbl. 70
Turk's Island, per bbl ..... 25
**Salt Cake**—Per 100 lbs..... 55
**Saltpeter**—Crude, per lb... ... .. 4½
Refined, per lb..... ..... .... 6
**Silenium**—(Metallic ..... ...
**Slate**—Purple and green roofing, per 100 ft... ..... 6 00
Red roofing, per 100 sq. ft... ....15.00
Black, roofing, per 100 sq. ft. ... 5.00
**Soda Ash**—Carb., 48 p. c., p. 100 lbs..... ... ..... .... 2.30
Caustic, 48 p. c., per 100 lbs . . 2.35
Caustic, 70 p. c., per 100 lbs..... 2.38
Sal, English, per 100 lbs ..... .. 1.30
Sal, American, per 100 lbs .. ... 1.15
Nitrate, per 100 lbs..... 2.00
**Sodium**—(Metallic) per lb..... 4.50
**Spelter**—See Zinc.
**Strontium**—(Metallic), per oz..128.00
Nitrate, per lb ..... .... 10½
**Sulphur**—Roll, per lb..... .... 1½
Flour, per lb ..... ..... 1¾
Crude Brimstone, 2s., per ton....20.00
Crude Brimstone, thirds, per ton..19.00
**Talc**—Ground French, per lb.. ... 1¼
Domestic, per lb..... ..... 6
Domestic, per ton..... ... .....15.00
Cl. f. Liverpool, per ton..... £4 5 0
**Tannin**—Pure, per lb. .....
**Tantalum**—(Metallic) per oz... 144.00
**Tellurium**—(Metallic) per oz.... 9.00
**Thallium**—(Metallic) per oz..... 3.00
**Titanium**—(Metallic) per oz....32.00
**Thorium**—(Metallic) per oz ....272.00
**Tungsten**—(Metallic) per oz..... 4.00
**Vanadium**—(Metallic), per oz..320.00
**Vermillion**—American, per lb... 50
English, per lb. . ..... 65
**Vitriol**—(Blue), Ordinary, per lb.. 4½
Extra, per lb ..... 4¾
**Yttrium**—(Metallic), per oz ....144.00
**Zinc oxide**—Am., Dry, per lb.... 4¼
Antwerp, Red Seal, per lb..... 5⅝
Paris, Red Seal, per lb..... 6⅛
**Zirconium**—(Metallic), per oz..240.00

### IRON AND STEEL.

#### New York Prices.

**American Pig-Iron,**
No. 1 X.... .$20.50@$21.50 at tidewater
No. 2 X..... $18 50@$19.50 " "
Forge.. ... $17@ . .... " "
**Scotch Pig**—Coltness... .$21.25@$21.50
Clyde.. ..... 19.75@ .....
Dalmellington..... .... @ 19.50
Summerlee..... 21.00@ .....
Gartsherrie..... ..... 21 00@ .....
Shotts... ..... 21.00@ .....
*By Cable to-day to the Metal Exchange:*
Scotch Warrants.....40s. 9d.
Coltness, at Glasgow .... .... 50s. 6d.
Langloan, at Glasgow.....47s.
Summerlee, at Glasgow.....49s.
Gartsherrie, at Glasgow.... .....46s. 9d.
Glengarnock, at Aidrossan.....46s.
Dalmellington, at Ardrossan.....43s.
Eglinton, at Ardrossan ... .....42s.
**Bessemer Pig**—
Foreign, nominally..... $19.75@$20.00
Domestic.
**Spiegeleisen**—
German, 20 per cent.. ... $26.00
English, 20 " " .....$26 50@ 27.00
" 30 " " ..... 31.00
Ferro Manganese..... 55.50
**Steel Blooms**..... 30.00@ 30 50
**Steel Billets**..... 30.00@ 30.50
**Steel Nail Slabs**.. ..... 30 50@ 31.00
**Steel Wire Rods**.. .... 40.00@ 40.50
**Steel Rails**—
Heavy sections, at mill....$32.00@ 32.50
Light " " .... 34.50@ 39.50
**Structural Iron and Steel**—
Bridge Plate, at mill.. .... ....2¼@2·3c.
Angles, at mill ..... ....2·3@2·4c.
Tees, at mill..... .....2 6@2·8c.
Steel Angles, at mill..... ....2·6@2·75c.
Beams and Channels, on wharf, 3·3c. base.
**Steel Plates**—
Tank and Ship, on wharf..... 2·7@2·9c.
Boiler Shell, on wharf... ....3 .....
" Flange, " ... ... 3½ .....
" Fire-Box, on wharf.... 4 @4¼c.
**Iron Plates**—
Common tank, on wharf. . . .2·3@2·4c.
Refined tank, on wharf..... .2·5@2·6c.
Boiler shell, " ..... .2·7@2·8c.
Boiler flange, " ..... ...3·7@3·8c.
Extra flange, " ..... 4¼@4½c.
**Bar Iron**—
Refined..... .....2@2·1c. base.
Common..... 1·9@2c. "
**Merchant Steel**—
American tool ..... ..... 8½@10c.
Special grades..... 13 @20c.
Crucible machinery..... 5 @6c
" spring..... .... ... 4½c.
Bessemer machinery..... 2·2@2·5c.
" spring. . . ..... 2·2@2·5c.
**Cast-Iron Pipe**—
According to size..... .. $27.00@$34.00
**Wrought-Iron Pipe**—List adopted Oct. 26, 1887.
Butt-Welded, Plain and Tarred, 47½ per cent disc.; Galv., 37½ per cent disc.
Lap-Welded, Plain and Tarred, 57½ per cent disc; Galv., 45 per cent disc.
**Boiler Tubes**—52½ per cent disc.; Casing, 50 per cent disc.
**Rail Fastenings**—
Spikes..... ... ..... 2·3 @2·4c. delv'd
Angle Fish-bars..... .2·10@2·15c.
Bolts and Sq. Nuts.....2·9 @ 3c.
" " Hex. " . .....3·1 @3·2c.
**Wrought Scrap**—
Foreign *ex ship*.....$20.00@$20.50
No. 1 Yard .... ..... 20.50@ 21.00
**Cast Scrap** ..... .. 15.00@ 16.00
**Old Car Wheels**..... ... 19.00@ 19.50
**Old Rails**—Tees .. .... 21.50@ 21.75
—Doubles ..... 22.00@ 22.50
**Nails**—In car-load lots. .. 2.00@ ....
—From store .... .... 2.05@ ...

#### Louisville Prices.

**Pig-Iron**—
So. Coke, No. 1 Foundry..$20.00@$20.50
" " No. 2 " .. 19.00@ 19.50
" " No. 2½ " .. 18.00@ 19.00
Hg. Rock Coke, No. 1 F'dry 19.50@ 20.50
" " Charcoal, No. 1 Foundry ..... 22.50@ 24.00
So. Charcoal, No. 1 F'dry .. 20.50@ 21.50
Silver Gray, different gr'des 17.50@ 19.00
So. Coke, No. 1 Mill, Neutral 17.25@ 18.25
" " No. 2 " " 16.75@ 17.75
" " No. 1 Mill, Cold Short ..... 16.75@ 17.75
So. Charcoal, No. 1 Mill.... .....
White&Mottled, diff't gr'ds. 15.00@ 16.00
So. Car-Wheel, St'rd Br'nds 24.00@ 25.00
" " Other " 22.00@ 23.00
Hanging Rock, Cold-Blast.. 24.00@ 25.00
" " Warm-Blast 20.00@ 21.00

#### Philadelphia Prices.

Foundry No. 1..... ... $21.00@22.00
Foundry No. 2. ..... 18.50@19.50
Gray Forge..... 17.00@17.50
Bessemer Pig..... .... 20.25@. ...
Steel Rail Blooms..... 29.50@. ...
Foreign Bessemer..... 19.75@20 00
Spiegeleisen. ..... 27.00@27.50
Scrap, Selected..... 22.00@. ....
No. 1 ... ... .. .... 21.00@. ....
Cargo Scrap..... ... .. .... 21.00@.....
Muck-Bars.. ..... ..... 30.50@. ...
Merchant Iron..... ..... 1.90@@2.10c.
Plate Iron..... 2.30@ 2.50
Tank Iron..... 2.40@ 2.50
Skelp Iron..... ..... 2.00@.....
Angles... ..... 2.30@.. ..
Beams and Channels..... .. 3.30@. ....
Nails ..... ..... 2.00@ 2.15
Steel Rails. ..... ... 32.50@33.50
Old Rails..... 22.00@22.50

#### Pittsburg Prices.

**Coke or Bituminous Pig**—
Foundry No. 1..... ... ..$19 50@19.75
Foundry No. 2..... .... 18.00@18.75
Gray Foundry No. 3..... 17.25@17.50
" " No. 4... .. .. 16.75@17.00
White ..... .. ... .... .... 16.50@16.75
Mottled.... ..... 16.50@16.75
Silvery ..... ..... ... .... 19.00
Bessemer..... ..... 19.00@19.50
**Charcoal Pig**—
Foundry No. 1. ..... .. 25.00@25.75
Foundry No. 2..... . . 24.00@24.75
Cold-Blast..... ..... 26.00@30.00
Warm-Blast..... .... 25.00@27.00
20 p. c. Spiegel..... 28.00@28.50
Muck-Bar..... ..... 30 50@31.00
Steel Blooms..... ..... 31.00@32.00
Steel Slabs ..... . ..... 29.50@30.00
Steel Crop Ends.... .... ..... 21.00
Steel Bloom Ends.. ..... 20.50
Steel Billets.... .... ...(dull) 29.50@30.00
Old Iron Rails... ..... .. .. 24 50@25.00
Old Steel Rails..... ..... .... 23.00@23.50
No. 1 W. Scrap..... ..... 20 00@20.25
No. 2 W. Scrap.... ..... 18.00@18.25
Steel Rails..... ..... .... 34.00@35.00
" light sections .. ..... 35.00@38.00
Bar Iron., nominal..... 1.90@ 2.00
Nails $2 net car lots.
Steel Nails $2 net car lots. Two per cent off for cash.

### ALUMINUM.

Bronze (10 %), ₱ lb..... 40c.

### COPPER.

Lake Ingot, ₱ lb .... ..... ...15@16c.
Electrolytic, ₱ lb ... .... ..... 17c.
Casting Brands, ₱ lb ... ..... 15c.
Arizona Black.....
Matte, ₱ unit of Copper .....
Chili Bars, London, ₱ ton.....£67 15s.
Am. Matte, Liverpool, ₱ unit....
Sheet Copper (according to size), ₱ lb..... .....20 @33c.

**Lead**—
Domestic, Common..... 5¼c.
Domestic, Refined ..... ....
Foreign ..... ..... ..... 5¼c.
Sheet, ₱ lb..... ..... 6 @ 7c.
Pipe, ₱ lb .. ... ..... @ 7c.
Tin lined Pipe, ₱ lb.....15c.
Shot, ₱ lb..... 6 @ 7c.

**Tin**—
Banca pigs, ₱ lb..... .. .....
English, pigs, ₱ lb.....
Straits, pigs, ₱ lb.....
Straits in bars, ₱ lb.....
Ch., bright I. C., ₱ box.....
Coke, bright, ₱ box. .....
Coke, Ternes, ₱ box..... ....

**Zinc**—
Domestic spelter, ₱ lb.....
Foreign spelter, ₱ lb... . .....
Silesian, London, ₱ ton..... £
Sheet, American, ₱ lb... .....
Sheet, foreign, ₱ lb.....

### STOCK MARKET QUOTATIONS

#### Baltimore Stock Quotations.

| COMPANY. | Bid. | Asked. |
|---|---|---|
| Atlantic Coal.... | $1.50@$1.55 | $1.75 |
| Balt. & N. C. .... | .37@.39 | .45 |
| Big Vein Coal.. | .... | .... |
| Conrad Hill . .. | .12@.13 | .20 |
| Diamond Tunnel | .40@.45 | .. |
| George's Crk. C. | 97.00@ 98.00 | |
| Lake Chrome.. | .10@.20 | .... |
| N. State, Balto.. | .50@.55 | .... |
| Ore Knob ..... | .05@.09 | .10 |
| Silver Valley.... | 1.50 | |

Highest and lowest prices bid and asked during the week ending December 1st.

#### Birmingham, Ala., Stock Quot

| COMPANY. | Bid. | Asked. |
|---|---|---|
| Ala. Conn. C.. | .... | 100 |
| Bir. Min. & Mfg. | 125 @160 | .... |
| Decat. L. Imp. & Fur..... | 24½@ 25 | 25¾@ 26½ |
| DecaturMin. L. | .... | 31 @ 32 |
| Enterprise Mfg | .. | 70 |
| Sloss I. & S... | .... | .... |
| *Sloss I. & S.. | .... | .... |
| Sheffield C. & I. | 68 @ 71 | 72 @ 73½ |
| WoodstockS&I | 50 | .... |

* Bonds.

Highest and lowest prices bid and asked November 30th.

#### Deadwood-Dak. Quotations.

| Comp'y. | H. | L. | Comp'y. | H. | L. |
|---|---|---|---|---|---|
| Bullion... | .05 | .02 | Mugw'mp | .... | .... |
| C'nt'e Sh't | .03 | .01 | Poc'h'ntas | .01¼ | .01 |
| Cora .... | . | .. | Rattler... | .18 | .08 |
| Ent'rp'se. | .02 | .02 | Ruby Bell | .05 | .03 |
| Eureka .. | .04 | .04 | Seabury.. | .10 | .04 |
| Hester A. | .06 | .02½ | Seg'eg'ted | .06 | .02 |
| Iron Hill.. | ... | ... | Silv'rRid'e | .04 | .01 |
| Jefferson. | .. | ... | Sp'nish R. | .24 | .12 |
| Liberty .. | ... | ... | U.S.Gr'nt | .... | .... |
| Minna.... | .02 | .01 | West Va . | .01½ | .01 |
| Mutual. .. | .10 | .04 | | | |

Highest and lowest prices bid and asked during the week ended November 26th.

#### Pittsburg Stock Quotations.

| COMPANY. | H. | L. | Closing. |
|---|---|---|---|
| Bridgewater Gas .. | 100.00 | 95.00 | 99.25 |
| Chartiers Val. Gas. | 83.00 | 80.00 | 83.00 |
| Columbia Oil Co.. | ..... | ... ... | ..... |
| Consignee Min. Co. | .40 | .35 | .35 |
| Forest Oil Co .. .. | 90.00 | 88.00 | 90.00 |
| Gogebic Iron Synd. | ..... | ..... | .... . |
| Hazlewood Oil Co. | ..... | .. .. | ..... |
| Iron City Min. Co: | ... | ..... | ..... |
| La Noria Mining .. | 3.62½ | 3.00 | 3.25 |
| M'f'turers' Gas.... | ... .. | ..... | ... . |
| Mansfi'd C.& C.Co. | ..... | ..... | ..... |
| Nat. Gas Co., W. Va. | ..... | ..... | ..... |
| N. Y. & Cleve. Gas Coal.... ... .... | 43.00 | 43.00 | 43.00 |
| Ohio Valley Gas... | 43.50 | 40.00 | 40.00 |
| Pennsylvania Gas. | 25.00 | 25.00 | 25.00 |
| People's Nat. Gas.. | ..... | ..... | ..... |
| Philadelphia Gas.. | 48.00 | 47.37½ | 47.62½ |
| Pine Run Gas Co.. | ..... | ..... | ..... |
| Silverton Mining.. | .... | ..... | ..... |
| South Side Gas.. . | ..... | ..... | ..... |
| Tuna Oil Co..... | 65.00 | 65.00 | 65.00 |
| W't'h'se Air-Brake. | 135.00 | 130.00 | 135 00 |
| W't'ghouse Brake. | 57.50 | 55.00 | 57.50 |
| Westmoreland & Cambria Gas.. | ..... | ..... | ... .. |
| Wheeling Nat. Gas. | 28.00 | 26.50 | 25.13 |
| Yankee Girl Mining | .... . . . | | ..... |

Highest and lowest prices bid and asked during the week ending December 1st.

#### London Quotations.

| COMPANY. | Highest. | Lowest. |
|---|---|---|
| Alturas Gold, Idaho... | 15s. 6d. | 14s. 6d. |
| Anglo-Montana, Mont.. | ... | ... |
| Arizona Copper, Ariz.. | £½ | £⅜ |
| Birdseye Creek, Cal. .. | 8s. | 6s. |
| California Gold, Colo.. | 8s. 6d. | 7s. 6d. |
| Carlisle, N. Mex ..... | £1¼ | £1 |
| Centennial, Cal. . .... | 20s. | 15s. |
| Charles Dickens, Id.... | 3s. 3d. | 2s. 9d. |
| Colorado United, Colo.. | 20s | 15s. |
| Denver Gold, Colo..... | 2s. 6d. | 1s. 6d. |
| Eberhardt, Nev ..... | 5s | 4s. 6d. |
| Empire, Mont ..... | £3⅛ | £2⅝ |
| Flagstaff, Utah..... | 7s. 6d. | 6s. 6d |
| Garfield, Nev... ..... | 25s. | 22s. |
| Gold Hill, N. C..... | 3s. | 2s. |
| Kohinoor, Colo..... | 2s. 6d. | 1s. 6d. |
| Montana Lt., Mont .... | £3⅛ | £3⅜ |
| New California, Colo... | 8s. 6d. | 7s. 6d. |
| New Consolidated .... .. | 2s. 6d. | 2s. |
| New Emma, S., Utah... | 5s. | 4s. 6d. |
| New Hoover Hill, N. C. | 3s. | 2s. |
| New La Plata, Colo... | 3s. 6d. | 2s. 6d. |
| Plumas Eureka, Cal.... | £⅝ | £⅝ |
| Richmond Con., Nev... | £4¾ | £4½ |
| Ruby&Dunderberg, Nev | 5s. | 4s. |
| Russell Gold, N. C..... | 2s. 6d. | 2s. |
| Sierra Buttes, Cal..... | £1 | £¾ |
| Stanly, N. C.... ..... | £1 | £⅞ |
| Union Gold, Colo..... | 5s. | 4s. |
| U. S. Placer, Colo..... | £1 | £¾ |
| Viola Lt., Idaho ..... | 23s. | 21s. |

Highest and lowest prices November 19th.

## DIVIDEND-PAYING MINES.

| | Name and Location of Company. | | Capital Stock. | Shares. No. | Shares. Par | Assessments. Total levied. | Assessments. Date and amount of last | | Dividends. Total paid. | Dividends. Date and amount of last | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Adams, s. L. | Colo. | $1,500,000 | 150,000 | $10 | * | | | $555,000 | Jan | 1887 | .15 |
| 2 | Alice, s. c. | Mont | 10,000,000 | 400,000 | 25 | * | | | 750,000 | Sept | 1886 | .06¼ |
| 3 | Alturas, G | Idah. | 1,500,000 | 300,000 | 5 | | | | 95,000 | Sept | 1886 | .50 |
| 4 | Amie Con., s. L. | Colo. | 5,000,000 | 500,000 | 10 | * | | | 330,000 | Oct. | 1883 | .05 |
| 5 | Amy & Silversmith, s. | Mon. | | 341,419 | | | | | 247,530 | Aug | 1887 | .12½ |
| 6 | Atlantic, c. | Mich | 1,000,000 | 40,000 | 25 | $280,000 | Apl. | 1875 | 360,000 | Jan. | 1887 | 1.00 |
| 7 | Argenta, s | Nev.. | 10,000,000 | 100,000 | 100 | 295,000 | July | 1885 | 40,000 | Feb. | 1880 | 20 |
| 8 | Aurora, l. | Mich. | 2,000,000 | 100,000 | 20 | | | | 155,000 | Oct. | 1887 | 1.87½ |
| 9 | Bassick, G. s. | Colo. | 10,000,000 | 100,000 | 100 | * | | | 400,000 | Mar. | 1884 | 1.00 |
| 10 | Belle Isle, s. | Nev.. | 10,000,000 | 100,000 | 100 | 160,000 | Feb | 1887 | 300,000 | Dec. | 1879 | .25 |
| 11 | Belcher, G. s. | Nev.. | 10,400,000 | 104,000 | 100 | 2,289,335 | Sept | 1887 | 15,397,000 | Apl. | 1876 | 1.00 |
| 12 | Bellevue Idaho, s. L. | Idah. | 1,250,000 | 125,000 | 10 | 57,500 | Nov. | 1887 | 200,000 | Jan | 1887 | .10 |
| 13 | Big B'nd Hydraulic, G | Dak.. | 1,000,000 | 200,000 | 5 | * | | | 253,000 | Aug. | 1887 | .03 |
| 14 | Black Bear, G. | Cal.. | 3,000,000 | 30,000 | 100 | 22,500 | Dec. | 1884 | 895,000 | May | 1883 | .20 |
| 15 | Bodie Con., G. s. | Cal.. | 10,000,000 | 100,000 | 100 | 424,990 | Aug | 1887 | 1,602,572 | Apl. | 1885 | .50 |
| 16 | Bonanza Developm't | C&M | 3,000,000 | 300,000 | 10 | | | | 135,000 | Oct. | 1882 | .15 |
| 17 | Bonanza K'g, Cons. s. | Cal.. | 1,000,000 | 100,000 | 10 | * | | | 185,000 | Feb. | 1885 | .10 |
| 18 | Boston & Mont, G. | Mont | 2,500,000 | 250,000 | 10 | * | | | 520,000 | Jun | 1886 | .15 |
| 19 | Breece, s. | Colo. | 5,000,000 | 200,000 | 25 | * | | | 2,000 | Feb. | 1880 | .01 |
| 20 | Brooklyn Lead, L. s. | Utah | 500,000 | 50,000 | 10 | | | | 127,000 | July | 1887 | .05 |
| 21 | Bulwer, G. | Cal | 10,000,000 | 100,000 | 10 | 60,000 | July | 1887 | 175,006 | Jan. | 1884 | .10 |
| 22 | Caledonia, G. | Dak. | 10,000,000 | 100,000 | 100 | 505,000 | May | 1885 | 40,000 | Feb. | 1886 | .10 |
| 23 | Calumet & Hecla, C. | Mich | 2,500,000 | 100,000 | 25 | 1,200,000 | .. | | 29,350,000 | July | 1887 | 5.00 |
| 24 | Carbonate Hill, s. L. | Colo. | 2,000,000 | 200,000 | 10 | * | | | 80,006 | Apl. | 1884 | .05 |
| 25 | Caribou Con., s. | Colo. | 1,500,000 | 150,000 | 10 | * | | | 50,000 | Mch | 1880 | .10 |
| 26 | Castle Creek, G. | Idah. | 100,000 | 100,000 | 1 | | | | 51,000 | Oct. | 1883 | .03 |
| 27 | Catalpa, s. L. | Colo. | 3,000,000 | 300,000 | 10 | * | | | 270,000 | May. | 1884 | .10 |
| 28 | Central, c. | Mich | 500,000 | 20,000 | 25 | 100,000 | Sept | 1861 | 1,820,000 | Feb. | 1887 | 2.00 |
| 29 | Christy, s. | Utah | 10,000,000 | 100,000 | 100 | | | | 10,000 | Jun. | 1885 | .10 |
| 30 | Chrysolite, s. L. | Colo. | 10,000,000 | 200,000 | 50 | * | | | 1,650,000 | Dec. | 1884 | .25 |
| 31 | Colorado Central, s. L. | Colo. | 2,750,000 | 275,000 | 10 | * | | | 241,375 | Nov. | 1887 | .05 |
| 32 | Cons. Cal. & Va., G. s. | Nev.. | 21,600,000 | 216,000 | 100 | 108,000 | Jan. | 1885 | 1,144,000 | Oct. | 1887 | .50 |
| 33 | Con. Gold Mining, G. | Ga.. | 500,000 | 100,000 | 5 | * | | | 108,000 | Nov. | 1883 | .02 |
| 34 | Contention, s. | Ariz. | 12,500,000 | 250,000 | 50 | | | | †2,587,000 | Dec. | 1884 | .25 |
| 35 | Crescent, s. L. G. | Utah | 15,000,000 | 600,000 | 25 | ‡ | | | 210,000 | Aug. | 1886 | .05 |
| 36 | Crown Point, G. s. | Nev.. | 10,000,000 | 100,000 | 100 | 2,675,000 | Feb. | 1882 | 11,588,000 | Jan. | 1875 | 2.00 |
| 37 | Daly, s. L. | Utah | 3,000,000 | 150,000 | 20 | | | | 375,000 | Nov. | 1887 | .50 |
| 38 | Deadwood-Terra, G. | Dak.. | 5,000,000 | 200,000 | 25 | * | | | 11,000,000 | Nov. | 1887 | .10 |
| 39 | Derbec B. Grav., G. s. | Cal.. | 10,000,000 | 100,000 | 100 | 90,000 | Dec. | 1881 | 180,000 | May | 1887 | .10 |
| 40 | Dunkin, s. L. | Colo. | 5,000,000 | 200,000 | 25 | * | | | 950,000 | Oct | 1887 | .10 |
| 41 | Elkhorn, G. s. | Mont | 1,000,000 | 100,000 | 10 | 50,000 | July | 1883 | 180,000 | July | 1887 | .05 |
| 42 | Empire Lt., G. | Mont | 500,000 | 100,000 | 5 | | | | 33,000 | Mar | 1887 | .05 |
| 43 | Eureka Con., G. s. L. | Nev.. | 5,000,000 | 50,000 | 100 | 500,000 | July | 1888 | 4,868,000 | Dec. | 1887 | .25 |
| 44 | Evening Star, s. L. | Colo. | 500,000 | 50,000 | 10 | * | | | 1,400,000 | Nov | 1883 | .50 |
| 45 | Excelsior, G. | Cal.. | 10,000,000 | 100,000 | 100 | 560,000 | Sept | 1885 | 875,000 | Oct.* | 1880 | .25 |
| 46 | Father de Smet, G. | Dak.. | 10,000,000 | 100,000 | 100 | 200,000 | Nov | 1878 | 1,125,000 | Dec. | 1885 | .20 |
| 47 | Franklin, c. | Mich | 1,000,000 | 40,000 | 25 | 220,000 | Jun. | 1871 | 560,000 | Dec. | 1886 | 1.00 |
| 48 | Freeland, G. s. c. | Colo. | 5,000,000 | 200,000 | 25 | * | | | 190,000 | July | 1886 | .10 |
| 49 | Fresno Enterprise, G | Cal.. | 5,000,000 | 100,000 | 50 | | | Mch 1883 | 110,000 | July | 1882 | .10 |
| 50 | Garfield Lt., G. s. | Nev. | 500,000 | 100,000 | 5 | | | | 25,000 | Mar. | 1885 | .12½ |
| 51 | Gould & Curry, G. s. | Nev.. | 10,800,000 | 108,000 | 100 | 4,213,400 | Nov. | 1.87 | 3,826,000 | Oct. | 1870 | 10.00 |
| 52 | Grand Central, s. | Ariz. | 1,000,000 | 100,000 | 10 | | | | 625,000 | Dec. | 1882 | .25 |
| 53 | Grand Prize, s. | Nev.. | 10,000,000 | 100,000 | 100 | 570,000 | Apl. | 1886 | 495,000 | Mar. | 1884 | .25 |
| 54 | Granite, s. | Colo. | 125,000 | 125,000 | 1 | | | | 6,250 | May | 1883 | .01 |
| 55 | Granite Mountain, s. | Mont | 10,000,000 | 400,000 | 25 | | | | 3,400,000 | Nov. | 1887 | .50 |
| 56 | Green Mountain, G. | Cal.. | 1,250,000 | 125,000 | 10 | * | | | 212,000 | Nov. | 1881 | .07½ |
| 57 | Hale & Norcross, G. s. | Nev.. | 11,200,000 | 112,000 | 100 | 5,086,800 | July | 1887 | 1,598,000 | Apl. | 1871 | 5.00 |
| 58 | Hall-Anderson, G. | N. S.. | 150,000 | 150,000 | 1 | | | | 7,000 | Jan. | 1882 | .05 |
| 59 | Hecla Con., s. G. L. C. | Mont | 1,500,000 | 30,000 | 50 | | | | 1,047,000 | Aug. | 1886 | .50 |
| 60 | Hel'a Mg & Red, G. s. L | Mont | 3,315,000 | 663,000 | 5 | * | | | 197,970 | July | 1886 | .06 |
| 61 | Holmes, s. | Nev.. | 10,000,000 | 100,000 | 100 | 300,000 | Sept | 1885 | 75,000 | Apl. | 1886 | .25 |
| 62 | Holyoke, G. | Idah. | 200,000 | 200,000 | 1 | | | | 27,000 | Feb. | 1883 | .10 |
| 63 | Homestake, G. | Dak. | 12,500,000 | 125,000 | 100 | 300,000 | July | 1878 | 3,968,750 | Nov. | 1887 | .20 |
| 64 | Honorine, s. L. | Utah | 500,000 | 250,000 | 2 | 25,000 | Jun. | 1883 | 125,000 | Sept | 1887 | .05 |
| 65 | Hope, s. | Mont | 1,000,000 | 100,000 | 10 | * | | | 183,252 | Oct. | 1887 | .25 |
| 66 | Horn-Silver, s. L. | Utah | 10,000,000 | 400,000 | 25 | * | | | 4,000,000 | Nov. | 1884 | .50 |
| 67 | Idaho, G. | Cal.. | 310,000 | 3,100 | 100 | | | | 4,539,500 | Apl. | 1887 | 5.00 |
| 68 | Ideal, s. L. | Colo. | 1,500,000 | 50,000 | 10 | | | | 15,000 | Oct. | 1886 | .05 |
| 69 | Illinois, s. | N. M. | 100,000 | 100,000 | 1 | * | | | 25,000 | Jan | 1887 | .25 |
| 70 | Independence, s. | Nev.. | 10,000,000 | 100,000 | 100 | 340,000 | Oct. | 1886 | 225,000 | Sept | 1879 | .25 |
| 71 | Indian Queen, s. | Nev.. | 250,000 | 125,000 | 2 | | | | 368,750 | July | 1883 | .03 |
| 72 | Invo, G. | Cal.. | 500,000 | 100,000 | 5 | * | | | 45,000 | Apl. | 1882 | .05 |
| 73 | Iron Hill, s. | Dak. | 2,500,000 | 250,000 | 10 | 82,500 | Oct. | 1885 | 156,250 | Nov. | 1887 | .07½ |
| 74 | Iron-Silver, s. L. | Colo. | 10,000,000 | 500,000 | 20 | * | | | 2,100,000 | Oct. | 1887 | .20 |
| 75 | Jackson, G. s. | Nev. | 5,000,000 | 50,000 | 100 | 10,000 | Nov | 1880 | 45,000 | Oct. | 1886 | .10 |
| 76 | Jocuistita, s. | Mex. | 2,500,000 | 250,000 | 10 | | | | 1,200,000 | Feb. | 1885 | .50 |
| 77 | Jumbo, G. | Colo. | 2,000,000 | 200,000 | 10 | | | | 15,000 | Jun. | 1887 | .02½ |
| 78 | Kentuck. | Nev.. | 3,000,000 | 30,000 | 100 | 342,000 | Nov | 1881 | 1,600,000 | Dec. | 1886 | .10 |
| 79 | La Plata, s. L. | Colo. | 2,000,000 | 200,000 | 10 | * | | | 610,000 | Sept | 1882 | .30 |
| 80 | Leadville Cons., s. L. L. | Colo. | 4,000,000 | 400,000 | 10 | * | | | 430,000 | Apl. | 1887 | .05 |
| 81 | Lexington, G. s. | Mont | 4,000,000 | 40,000 | 100 | * | | | 565,000 | Jan. | 1885 | 2.00 |
| 82 | Little Chief, s. L. | Colo. | 10,000,000 | 200,000 | 50 | * | | | 780,000 | Mch | 1885 | .10 |
| 83 | Little Pittsburg, s. L. | Colo. | 20,000,000 | 200,000 | 100 | * | | | 1,050,000 | Mch. | 1880 | .50 |
| 84 | Manhattan, s. | Nev | 5,000,000 | 50,000 | 100 | 300,000 | Jun | 1887 | 1.00 | 437,500 | Feb | 1886 | .25 |
| 85 | Marguerite, G. | Cal.. | 500,000 | 25,000 | 20 | | | | 18,750 | Oct. | 1882 | .25 |
| 86 | Marion Bullion, G | N.C. | 500,000 | | | | | | 15,000 | Jan. | 1886 | |
| 87 | Martin White, s. | Nev.. | 10,000,000 | 100,000 | 100 | 1,150,000 | Mar. | 1886 | 25 | 140,000 | Dec. | 1886 | .25 |
| 88 | Mary Murphy, G. s. | Colo. | 350,000 | 3,500 | 100 | * | | | | 87,500 | Sept | 1887 | 5.00 |
| 89 | Minnesota, c. | Mica | 1,000,000 | 40,000 | 25 | 420,000 | Apl. | 1886 | 1 00 | 1,826,000 | Mar. | 1876 | |
| 90 | Mono, G. | Colo. | 5,000,000 | 50,000 | 100 | 610,000 | Sept | 1887 | .50 | 12,500 | Mar. | 1887 | .25 |
| 91 | Montana, Lt., G. s. | Mont | 3,300,000 | 630,000 | 5 | * | | | 1,247,400 | July | 1887 | .75 |
| 92 | Morning Star, s. L. | Colo. | 1,000,000 | 100,000 | 10 | | | | 750,000 | Nov. | 1887 | .25 |
| 93 | Moulton, s. G. | Mont | 2,000,000 | 400,000 | 5 | * | | | 380,000 | Dec. | 1887 | .07½ |
| 94 | Mount Pleasant, G. | Cal. | 150,000 | 150,000 | 1 | * | | | 150,000 | Feb. | 1887 | .30 |
| 95 | Mt. Diablo, s. | Nev | 5,000,000 | 50,000 | 100 | 137,500 | Jun. | 1880 | 2.00 | 80,000 | July | 1885 | .20 |
| 96 | Napa, G. | Cal.. | 700,000 | 100,000 | 7 | | | | | 290,000 | Jan. | 1883 | .10 |
| 97 | Navajo, s. | Nev.. | 10,000,000 | 100,000 | 100 | 450,000 | Mar. | 1887 | 30 | 325,000 | Feb. | 1885 | .25 |
| 98 | N. Hoover Hill, G. s. | N. C. | 300,000 | 120,000 | 2½ | * | | | | 30,000 | Dec. | 1885 | .06½ |
| 99 | New York Hill, G. | Cal.. | 5,000,000 | 50,000 | 100 | 62,500 | Oct. | 1885 | .15 | 215,000 | Aug. | 1882 | .10 |
| 100 | Northern Belle, s. | Nev.. | 5,000,000 | 50,000 | 100 | 425,000 | Jan. | 1884 | 8.30 | 2,400,000 | Apl. | 1883 | 50 |
| 101 | North Belle Isle, s. | Nev.. | 10,000,000 | 100,000 | 100 | 250,000 | Mar. | 1887 | .50 | 30,000 | Aug. | 1881 | .15 |
| 102 | Ontario, s. L. | Utah | 15,000,000 | 150,000 | 100 | | | | | 8,750,000 | Nov. | 1887 | .50 |
| 103 | Ophir, G. s. | Nev.. | 10,000,000 | 100,000 | 100 | 4,037,800 | Aug | 1887 | .50 | 1,595,000 | July | 1882 | 1.00 |
| 104 | Original, s. c. | Mont | 1,500,000 | 60,000 | 25 | * | | | | 126,000 | Oct. | 1887 | .05 |
| 105 | Osceola, c. | Mich | 1,250,000 | 50,000 | 25 | 480,000 | Apl. | 1876 | 1.60 | 1,022,500 | Jan. | 1887 | 1 00 |
| 106 | Oxford, G. | N. S. | 125,000 | 125,000 | 1 | * | | | | 34,500 | Oct. | 1885 | .02 |
| 107 | Paradise Valley, G. s | Nev. | 10,000,000 | 100,000 | 100 | 47,000 | Mar. | 1882 | .15 | 150,000 | Apl. | 1887 | .10 |
| 108 | Parrott, c. | Mont | 1,800,000 | 180,000 | 10 | | | | | 54,000 | Oct. | 1887 | .10 |
| 109 | Peacock, s. G. C. | N.M. | 2,000,000 | 200,000 | 10 | * | | | | 60,000 | Nov. | 1886 | |
| 110 | Pleasant Valley, G. s. | Cal.. | 10,000,000 | 100,000 | 100 | 10,000 | Mar. | 1884 | .10 | 30,000 | Dec. | 1882 | .05 |
| 111 | Plutus, G. s. C. L. | Colo. | 2,000,000 | 200,000 | 10 | * | | | | 20,000 | Feb. | 1886 | .10 |
| 112 | Plymouth Con., G. | Cal.. | 5,000,000 | 100,000 | 50 | * | | | | 2,200,000 | Dec. | 1887 | .40 |
| 113 | Prussian, s. L. | Colo. | 1,500,000 | 150,000 | 10 | | | | | 132,000 | Jan | 1883 | .10 |
| 114 | Quicksilver, pref., Q. | Cal.. | 4,300,000 | 43,000 | 100 | | | | | 914,150 | Aug. | 1887 | 1.50 |
| 115 | " com., Q. | Cal.. | 5,700,000 | 57,000 | 100 | | | | | 151,000 | July | 188- | .40 |
| 116 | Quincy, c. | Mich | 1,000,000 | 40,000 | 25 | 200,000 | Dec. | 1862 | | 4,610,000 | Aug. | 1887 | 1.00 |
| 117 | Richmond, s. L. | Nev.. | 1,350,000 | 54,000 | 25 | * | | | | 4,312,587 | Jun. | 1887 | 1.25 |
| 118 | Ridge, c. | Mich. | 500,000 | 20,000 | 25 | 220,000 | Mar | 1886 | .50 | 100,000 | Feb. | 1886 | .50 |
| 119 | Rising Sun, s. | Dak.. | 750,000 | 150,000 | 5 | * | | | | 52,000 | May | 1881 | .07½ |
| 120 | Robinson Con., s. L. | Colo. | 10,000,000 | 200,000 | 50 | * | | | | 585,000 | Mar. | 1886 | .05 |
| 121 | Robert E. Lee, s. L. | Colo | 10,000,000 | 500,000 | 20 | | | | | 100,000 | Dec. | 1882 | .50 |
| 122 | Rooks, G. | Vt. | 500,000 | 50,000 | 10 | * | | | | 61,000 | Apr | 1885 | .40 |
| 123 | Savage, s. | Nev.. | 11,200,000 | 112,000 | 100 | 6,324,000 | Sept | 1887 | 50 | 4,460,000 | July | 1869 | 3.00 |
| 124 | Security L. Mg., Mfg. | Colo. | 1,000,000 | 100,000 | 10 | * | | | | 50,000 | July | 1884 | |
| 125 | Shoshone, G. | Idah. | 150,000 | 150,000 | 1 | | | | | 7,500 | Apl. | 1883 | .01 |
| 126 | Sierra Buttes, G. | Cal.. | 225,000 | 22,500 | 10 | | | | | 1,477,245 | Oct. | 1887 | .31¼ |
| 127 | Sierra Grande, s. | N. M. | 2,500,000 | 500,000 | 5 | | | | | 860,000 | Sept | 1884 | .35 |
| 128 | Sierra Nevada, G. s. | Nev.. | 10,000,000 | 100,000 | 100 | 6,262,000 | Aug. | 1887 | .25 | 102,000 | Jan. | 1871 | 1.00 |
| 129 | Silver Cord, G. s. L. | Colo. | 5,000,000 | 500,000 | 10 | | | | | 225,000 | Nov. | 1883 | .25 |
| 130 | Silver King, s. | Ariz. | 10,000,000 | 100,000 | 100 | | | | | 2,000,000 | July | 1887 | .25 |
| 131 | Silverton, G. s. L. | Colo. | 2,000,000 | 200,000 | 10 | | | | | 76,000 | Nov | 1886 | .02 |
| 132 | Small Hopes Cons., s. | Colo. | 5,000,000 | 250,000 | 20 | * | | | | 3,062,500 | Nov. | 1887 | .20 |
| 133 | Smuggler, s. L. | Colo. | 600,000 | 60,000 | 10 | | | | | 96,700 | Aug. | 1883 | .25 |
| 134 | Socorro, c. | N. M. | 250,000 | 4,000 | 100 | | | | | 4,000 | Mch | 1882 | .00¼ |
| 135 | South Yuba, G. | Cal. | 2,000,000 | 40,000 | 50 | * | | | | 150,000 | Oct. | 1881 | .75 |
| 136 | Spring Valley, G. | Cal.. | 200,000 | 200,000 | 1 | 50,000 | Oct. | 1886 | .25 | 50,000 | Jan. | 1881 | .25 |
| 137 | Standard, G. s. | Cal.. | 10,000,000 | 100,000 | 100 | 25,000 | Oct. | 1884 | .25 | 3,545,000 | Dec. | 1887 | .10 |
| 138 | Stormont, s. | Utah | 500,000 | 500,000 | 1 | | | | | 155,000 | Nov. | 1881 | .05 |
| 139 | St. Joseph, L. | Mo.. | 1,500,000 | 150,000 | 10 | * | | | | 814,000 | Sept | 1887 | .20 |
| 140 | Surinam, G. | D. G. | 3,000,000 | 600,000 | 5 | | | | | 105,000 | Nov. | 1887 | .05 |
| 141 | Syndicate, G. | Cal.. | 10,000,000 | 100,000 | 100 | 38,720 | July | 1882 | .15 | 48,308 | Sept | 1885 | .10 |
| 142 | Tip Top, s. | Ariz. | 10,000,000 | 100,000 | 100 | 250,000 | Sept | 1883 | .25 | 100,000 | Nov. | 1881 | .20 |
| 143 | Tombstone, G. s. L. | Ariz. | 12,500,000 | 500,000 | 25 | * | | | | 1,250,000 | Apl. | 1882 | .10 |
| 144 | United Verde, C. | Ariz. | 3,000,000 | 300,000 | 10 | * | | | | 97,500 | Feb. | 1884 | .20 |
| 145 | Valencia, M. | N. M. | 150,000 | 1,500 | 100 | * | | | | 37,500 | Apl | 1886 | 2.50 |
| 146 | Viola Lt., s. L. | Idah. | 750,000 | 150,000 | 5 | * | | | | 74,500 | May | 1887 | .12½ |
| 147 | Vizina, s. | Ariz.. | 5,000,000 | 200,000 | 25 | * | | | | 140,000 | Apl. | 1882 | .10 |
| 148 | Yankee Girl | Colo. | 2,500,000 | 250,000 | 10 | | | | | 1,087,500 | July | 1887 | .10 |
| 149 | Yellow Jacket, G. s. | | 12,000,000 | 120,000 | 100 | 5,448,000 | Dec | 1885 | .75 | 2,184,000 | Aug. | 1871 | 1.50 |

## NON-DIVIDEND-PAYING MINES.

| | Name and Location of Company. | | Capital Stock. | Shares. No. | Shares. Par Value. | Assessments. Total levied. | Assessments. Date & am't of last, | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Agassiz Cons., s. L. | Colo. | $2,500,000 | 50,000 | $50 | * | | | |
| 2 | Albion, s. L. | Nev.. | 15,000,000 | 150,000 | 100 | $577,000 | July | 1883 | .25 |
| 3 | Allouez, c. | Mich | 2,000,000 | 80,000 | 25 | 240,000 | Feb | 1884 | |
| 4 | Alpha Con., G. s. | Nev.. | 3,000,000 | 30,000 | 100 | 460,000 | Aug. | 1887 | .50 |
| 5 | Alta, s. | Nev.. | 10,080,000 | 100,800 | 100 | 2,074,400 | Nov | 1887 | .50 |
| 6 | Amador, G. | Cal.. | 400,000 | 200,000 | 2 | * | | | |
| 7 | American Flag, s. | Colo. | 1,250,000 | 125,000 | 10 | 300,000 | Jun | 1877 | .50 |
| 8 | Anglo-Montana, Lt. | Mon. | 600,000 | 120,000 | 5 | | | | |
| 9 | Appalachian, Lt., G. | N. C. | 1,500,000 | 300,000 | 5 | | | | |
| 10 | Aspen Mg. & S., s. L. | Colo. | 2,000,000 | 200,000 | 10 | | | | |
| 11 | Barcelona, G. | Nev.. | 5,000,000 | 200,000 | 25 | * | | | |
| 12 | Bechtel Con., G. | Cal.. | 10,000,000 | 100,000 | 100 | 173,500 | Jan. | 1883 | .10 |
| 13 | Belmont, s. | Nev.. | 5,000,000 | 50,000 | 100 | 735,000 | Apl. | 1886 | .10 |
| 14 | Best & Belcher, G. s. | Nev.. | 10,080,000 | 100,800 | 100 | 1,900,590 | Aug. | 1887 | .50 |
| 15 | Big Pittsburg, s. L. | Colo. | 20,000,000 | 200,000 | 100 | * | | | |
| 16 | Bi-Metallic, s. | Mon. | 5,000,000 | 200,000 | 25 | * | | | |
| 17 | Black Jack, G. | Cal.. | 250,000 | 100,000 | 2½ | | | | |
| 18 | Boston Con., G. | Cal.. | 10,000,000 | 100,000 | 100 | 170,000 | Nov | 1883 | .25 |
| 19 | Bradshaw, s. | Ariz. | 2,250,000 | 225,000 | 10 | | | | |
| 20 | Brunswick, G. | Cal.. | 2,000 000 | 400,000 | 5 | * | | | |
| 21 | Bullion, G. s. | Nev.. | 10,000,000 | 100,000 | 100 | 5,050,000 | Aug. | 1887 | .50 |
| 22 | Bve and Bye | Ariz. | 1,000,000 | 100,000 | 10 | * | | | |
| 23 | Calaveras, G. | Cal.. | 500,000 | 500,000 | 1 | * | | | |
| 24 | Carisa, G. | Wy . | 500,000 | 100,000 | 5 | * | | | |
| 25 | Cashier, G. s. | Colo. | 500,000 | 250,000 | 2 | * | | | |
| 26 | Cen Contin'l, G. s. L. | Colo. | 2,000,000 | 200,000 | 10 | * | | | |
| 27 | Charles Dickens, G. s. | Idah. | 1,250,000 | 250,000 | 5 | * | | | |
| 28 | Cherokee, G. | Cal.. | 1,500,000 | 150,000 | 10 | | | | |
| 29 | Chollar, s. | Nev.. | 11,200,000 | 112,000 | 100 | 1,152,000 | Aug. | 1887 | .50 |
| 30 | Cinnamon Mt., G. s. | Colo. | 750,000 | 150,000 | 5 | * | | | |
| 31 | Climax, s. L. | Colo. | 2,000,000 | 200,000 | 10 | * | | | |
| 32 | Colorado No. 2, s. L. | Colo. | 100,000 | 10,000 | 10 | * | | | |
| 33 | Comstock, G. s. | Nev.. | 10,000,000 | 100,000 | 100 | 30,000 | Mar. | 1887 | .15 |
| 34 | Con. Imperial, G. s. | Nev.. | 5,000,000 | 50,000 | 100 | 1,175,000 | Sept | 1887 | .25 |
| 35 | Con. Pacific, G. s. | Cal.. | 6,000 000 | 60,000 | 100 | 183,000 | Sept | 1887 | 15 |
| 36 | Cons. Silver, s. | Mo.. | 2,500,000 | 250,000 | 10 | | | | |
| 37 | **Cop. Queen Cons, c. | Ariz. | 1,400 000 | 140,000 | 10 | | | | |
| 38 | Courtlandt. | Colo. | 500,000 | 50,000 | 10 | * | | | |
| 39 | Crescent, s. L. | Colo. | 3,000,000 | 300,000 | 10 | * | | | |
| 40 | Crocker, s. | Ariz. | 10,000.000 | 100,000 | 100 | 75,000 | May | 1887 | .10 |
| 41 | Crowell, G. | N. C. | 500,000 | 500,000 | 1 | | | | |
| 42 | Dahlonega, G. | Ga.. | 250,000 | 250,000 | 1 | * | | | |
| 43 | Dandy, s. | Colo. | 5,000,000 | 500,000 | 10 | | | | |
| 44 | Dardanelles, G. | Cal.. | 1,000,000 | 100,000 | 10 | * | | | |
| 45 | Decatur, s. | Colo. | 1,500,000 | 300,000 | 5 | * | | | |
| 46 | Denver City, s. L. | Colo. | 5,000,000 | 500,000 | 10 | * | | | |
| 47 | Denver Gold. | Colo. | 300,000 | 60,000 | 5 | | | | |
| 48 | Deseret, G. s. | Utah | 500,000 | 50,000 | 10 | * | | | |
| 49 | Dunderberg, s. | Colo. | 1,500,000 | 150,000 | 10 | * | | | |
| 50 | Durango, G. | Colo. | 500,000 | 500,000 | 1 | * | | | |
| 51 | Eastern Dev. Co., Lt. | N. S. | 1,500,000 | 150 000 | 10 | 990.000 | Mar. | 1886 | 1.00 |
| 52 | El Cristo, G. s. | U.S.C | 1,000,000 | 500,000 | 2 | | | | |
| 53 | El Dorado, G. | Cal.. | 1,000,000 | 250,000 | 4 | * | | | |
| 54 | El Talento, G. | U.S.C | 1,000,000 | 500,000 | 2 | | | | |
| 55 | Empire, s. | Utah | 10,000,000 | 100,000 | 100 | | | | |
| 56 | Enterprise, s. L. | Colo. | 800,000 | 80,000 | 10 | * | | | |
| 57 | Eureka Tunnel, s. L. | Nev.. | 10,000,000 | 100,000 | 100 | | | | |
| 58 | Exchequer. | Nev.. | 10,000,000 | 100,000 | 100 | 880,000 | July | 1887 | .20 |
| 59 | Found Treasure, G. s. | Nev.. | 10,000,000 | 100,000 | 100 | 6,030 | Nov. | 1887 | .06 |
| 60 | Gold Cup, s. | Colo. | 500,000 | 500,000 | 1 | * | | | |
| 61 | Gold Placer, G. | Colo. | 5,000,000 | 200,000 | 25 | 229,314 | Dec. | 1886 | |
| 62 | Gold Rock, G. | Cal.. | 1,000,000 | 500,000 | 2 | * | | | |
| 63 | Goodsnaw, G. | Cal.. | 10,000,000 | 100,000 | 100 | * | | | |
| 64 | Grand Belt, c. | Tex. | 12,000,000 | 120,000 | 100 | | | | |
| 65 | Grand Duke. | Colo. | 800,000 | 80,000 | 10 | | | | |
| 66 | Great Romance, G. | U.S.C | 1,000,000 | 500,000 | 2 | * | | | |
| 67 | Gregory-Bobtail, G. | Colo. | 550,000 | 550,000 | 1 | * | | | |
| 68 | Gregory Con., G. | Mon. | 3,000,000 | 300,000 | 10 | | | | |
| 69 | Harlem M. & M. Co, G. | Cal.. | 1,000,000 | 200,000 | 5 | | | | |
| 70 | Head Cent. & Tr. s. G | Ariz. | 10,000,000 | 100,000 | 100 | | | | |
| 71 | Hector, G. | Cal.. | 1,500,000 | 300,000 | 5 | | | | |
| 72 | Highland, c. | Mich | 500,000 | 25,000 | 25 | | | | |
| 73 | Hortense, s. | Colo. | 2,000,000 | 200,000 | 10 | | | | |
| 74 | Huron, c | Mich | 1,000,000 | 40,000 | 25 | 280,000 | May | 1887 | 3 00 |
| 75 | Iron Gold & Silver, s | N. M. | 2,000,000 | 200,000 | 10 | | | | |
| 76 | Iroquois, c | Mich | 1,250,000 | 50,000 | 25 | * | | | |
| 77 | J. D. Reymert. | Ariz. | 10,000,000 | 100,000 | 100 | * | | | |
| 78 | Julia Cons., G. s. | Nev.. | 11,000,000 | 110,000 | 100 | 1,452,000 | Apl. | 1887 | .10 |
| 79 | Kearsarge, c. | Mich | 1 250,000 | 50,000 | 25 | 150,000 | Oct. | 1887 | 1.00 |
| 80 | Laclede. | N. M. | 2,000,000 | 200,000 | 10 | | | | |
| 81 | Lacrosse, G. | Colo. | 1 000.000 | 100,000 | 10 | * | | | |
| 82 | Lee Basin, s. L. | Colo. | 5,000,000 | 500,000 | 10 | * | | | |
| 83 | Lucerne, s. | Colo. | 5,000,000 | 500,000 | 10 | * | | | |
| 84 | Mammoth Bar., G. | Cal.. | 10,000,000 | 100,000 | 100 | 50,000 | Dec. | 1881 | |
| 85 | Mariposa pref., G. | Cal.. | 5,000,000 | 50,000 | 100 | 1,687,500 | Feb. | 1883 | .25 |
| 86 | " common, G. | Cal.. | 10,000,000 | 100,000 | 100 | 1,975,000 | Dec. | 1881 | .20 |
| 87 | May Belle, G. | Cal.. | 10,000,000 | 100,000 | 100 | 84,000 | Mar. | 1884 | .15 |
| 88 | Mayflower Gravel. | Cal.. | 1,000,000 | 100,000 | 10 | 235,000 | Sept | 1887 | .25 |
| 89 | Medora, G. | Dak. | 250,000 | 250,000 | 1 | | | | |
| 90 | Mexican, s. | Nev.. | 10,000,000 | 100,000 | 100 | 2,615,960 | July | 1887 | .25 |
| 91 | Middle Bar G. | Cal. | 400,000 | 200,000 | 2 | * | | | |
| 92 | Mike & Starr, s. L. | Colo. | 1,000,000 | 200,000 | 5 | * | | | |
| 93 | Monitor, G. | Colo. | 100,000 | 100,000 | 1 | * | | | |
| 94 | Moose Silver, s. | Colo. | 3,000,000 | 300,000 | 10 | * | | | |
| 95 | Nachoochee, Lt., G. | Ga.. | 1,000,000 | 200,000 | 5 | | | | |
| 96 | Neath, G. | Colo. | 1,000,000 | 100,000 | 10 | | | | |
| 97 | Nevada Queen, s. | Nev. | 10,000,000 | 100,000 | 100 | 80,000 | Mar | 1887 | .50 |
| 98 | New Germany, G | N. S. | 100,000 | 100,000 | 1 | * | | | |
| 99 | New Pittsburg, s. L. | Colo. | 2,000,000 | 200,000 | 10 | * | | | |
| 100 | North Standard, G. | Cal.. | 10,000,000 | 100,000 | 100 | 20,000 | Nov | | |
| 101 | Noonday. | Cal.. | 600,000 | 60,000 | 10 | 208,000 | Dec. | 1881 | .10 |
| 102 | Oneida Chief, G. | Cal. | 500,000 | 125,000 | 4 | * | | | |
| 103 | Oriental. | Nev.. | 2,000,000 | 200,000 | 10 | | | | |
| 104 | Oriental & Miller, s. | Nev.. | 10,000,000 | 400,000 | 25 | | | | |
| 105 | Osceola, G. | Nev.. | 5,000,000 | 50,000 | 100 | * | | | |
| 106 | Overman, G. s. | Nev. | 11,520,000 | 115,200 | 100 | 3,765,680 | Aug. | 1887 | .25 |
| 107 | Park, s. | Utah | 2,000,000 | 200,000 | 10 | | | | |
| 108 | Peer, s. | Ariz. | 10,000,000 | 100,000 | 100 | 135,000 | Nov. | 1886 | .10 |
| 109 | Peerless, s. | Ariz. | 10,000,000 | 100,000 | 100 | 320,000 | Sept | 1887 | .25 |
| 110 | Phœnix. | Ariz. | 500,000 | 500,000 | 1 | | | | |
| 111 | Phœnix, G. s. | Ark. | 5,000,000 | 200,000 | 25 | * | | | |
| 112 | Phœnix Lead. | Colo. | 100,000 | 100,000 | 1 | * | | | |
| 113 | Pilgrim, G. | Cal.. | 600,000 | 300,000 | 2 | * | | | |
| 114 | Potosi. | Nev.. | 11,200.000 | 112,000 | 100 | 1,257,600 | Nov. | 1887 | .50 |
| 115 | Puritan s. G. | Colo. | 1,500,000 | 150,000 | 10 | * | | | |
| 116 | Quincy. | Colo. | 3,000,000 | 300,000 | 10 | | | | |
| 117 | Rappahannock

# NEW YORK MINING STOCK QUOTATIONS.

## DIVIDEND-PAYING MINES.

| NAME AND LOCATION OF COMPANY. | Nov. 26. | | Nov. 28. | | Nov. 29. | | Nov. 30. | | Dec. 1. | | Dec. 2. | | SALES. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | |
| Alice, Mon | .... | ..... | ..... | .... | .... | .... | .... | .... | .... | ..... | .... | ..... | ..... |
| rgenta, Nev | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Bassick, Colo | ..... | ..... | ..... | ... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| elcher, Nev | .... | .... | .... | .... | .... | .... | ..... | ..... | 11.50 | .... | .... | ..... | 150 |
| Belle Isle, Nev | ..... | ..... | ..... | ..... | .75 | .... | .... | .... | .65 | .... | .... | ..... | 1,050 |
| Bodie Cons., Cal | ..... | .... | 2.60 | 2.55 | .... | ..... | 2.50 | ..... | .... | ..... | .... | ..... | 950 |
| Breece, Colo | .... | ..... | .40 | .38 | .38 | .... | .... | .... | ..... | ..... | .... | ..... | 700 |
| Bulwer, Cal | .... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Caledonia, Dak | .... | ..... | .... | .... | ..... | ..... | .... | ..... | 1.70 | .... | 1.80 | 1.75 | 400 |
| Chollar, Nev | .... | .... | .... | .... | .... | .... | .... | ..... | 6.25 | .... | 6.13 | .... | 300 |
| Chrysolite, Colo | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .44 | ..... | 100 |
| Colorado Cent'l, Colo | .... | ..... | 2.10 | .... | .... | .... | .... | .... | .... | .... | .... | .... | 100 |
| Cons. Cal. & Va., Nev | 23.88 | ..... | 23.00 | 21.00 | 21.63 | .... | .... | .... | 23.37 | 22.50 | 22.63 | .... | 730 |
| Crown Point, Nev | .... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Deadwood, Dak | ..... | ..... | .... | .... | ..... | ..... | .... | ..... | 2 60 | .... | .... | .... | 200 |
| Dunkin, Colo | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Eureka Cons., Nev | .... | ..... | 6.88 | .... | ..... | ..... | .... | ..... | ..... | ..... | .... | ..... | 100 |
| Father de Smet, Dak | .... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Freeland, Colo | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Gold Stripe, Cal | .... | ..... | .... | .... | .... | .... | .... | .... | .02 | .... | .... | .... | 500 |
| Gould & Curry, Nev | 6.00 | 5.13 | ..... | .... | .... | .... | .... | ..... | .... | ..... | .... | ..... | 280 |
| Green Mountain, Cal | .... | ..... | .... | .... | .... | .... | .... | .... | .... | ..... | .04 | .... | 500 |
| Hale & Norcross, Nev | .... | ..... | 5.25 | 5.00 | ..... | ..... | 5.63 | .... | .... | ..... | 5.50 | .... | 1,000 |
| Helena, Mont | 1.00 | ..... | .... | .... | .... | .... | 1.00 | .... | .... | .... | .... | .... | 200 |
| Holyoke, Idaho | .... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Homestake, Dak | .... | ..... | 12.50 | .... | 12.75 | .... | .... | .... | 12.50 | 12.25 | .... | .... | 450 |
| Horn-Silver, Ut | ..... | ..... | .... | .... | .... | .... | 1.00 | .80 | 1.05 | .98 | 1.10 | 1.05 | 2,000 |
| Independence, Nev | ..... | .... | .... | .... | .40 | .... | .... | .... | .80 | .... | .... | .... | 300 |
| Iron Hill, Dak | ..... | .... | 2.25 | .... | .... | ..... | 2.00 | .... | .... | .... | .... | .... | 200 |
| Iron Silver, Colo | ..... | .... | 2.80 | .... | .... | .... | .... | .... | .... | .... | .... | .... | 700 |
| Leadville C., Colo | .... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Little Chief, Colo | .... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Little Pittsburg, Colo | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Martin White, Nev | .... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Mono, Cal | ..... | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Mount Diablo, Nev | .... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Navajo, Nev | .... | .... | .... | .... | 1.00 | .... | .... | .... | .... | .... | .... | .... | 1,000 |
| North Belle Isle, Nev | .... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Ontario, Ut | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Ophir, Nev | ..... | ..... | .... | .... | .... | .... | .... | .... | 11.75 | .... | .... | .... | 100 |
| Plymouth, Cal | ..... | ..... | 18.50 | .. | .... | .... | 18.75 | .... | 19 00 | .... | 19.00 | .... | 220 |
| Quicksilver Pref., Cal | ..... | ..... | 28.75 | .... | .... | .... | 30.25 | 29.00 | 32.25 | 30.00 | 33.50 | 32.00 | 3,800 |
| " Com., Cal | .... | ..... | 7.00 | 6.63 | ..... | .... | 6.13 | 6 00 | 7.50 | 6.13 | 9.00 | 7.50 | 4,425 |
| Robinson Cons., Colo | .... | ..... | .... | .... | .40 | .35 | .... | .... | .... | .... | .... | .... | 200 |
| Savage, Nev | ..... | ..... | ..... | .... | 7.88 | .... | .... | .... | 8.38 | .... | .... | .... | 200 |
| Sierra Nevada, Nev | .... | ..... | .... | .... | 5.75 | .... | .... | .... | .... | .... | .... | .... | 300 |
| Silver King, Ariz | ..... | ..... | .... | .... | 5.13 | 4.75 | .... | .... | .... | .... | 4.50 | .... | 380 |
| Standard, Cal | 2.35 | ..... | ..... | ..... | 2 35 | .... | 2.35 | .... | 2.50 | .... | .... | .... | 1,834 |
| Stormont, Ut | ..... | ..... | ..... | .... | .... | ..... | .... | ..... | .... | ..... | .... | ..... | ..... |
| Surinam, D. G. | ..... | ..... | ..... | .... | .... | ..... | .... | ..... | .... | ..... | .... | ..... | ..... |
| Yellow Jacket, Nev | .... | ..... | .... | .... | .... | ..... | .... | ..... | .... | ..... | .... | ..... | ..... |

## NON-DIVIDEND-PAYING MINES.

| NAME AND LOCATION OF COMPANY. | Nov. 26. | | Nov. 28. | | Nov. 29. | | Nov. 30. | | Dec. 1. | | Dec. 2. | | SALES. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | |
| Amador, Cal | 1.40 | ..... | 1.40 | ..... | 1.40 | ..... | 1.40 | ..... | 1.45 | 1.40 | 1.80 | 1.40 | 3,400 |
| Am. Flag, Colo | ..... | .... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Barcelona, Nev | ..... | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Bechtel Con., Nev | ..... | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Best & B'licher, Nev | ..... | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Big Pittsb'g, Colo | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Brunswick | 1.60 | ..... | 1.60 | .... | 1.60 | .... | 1 60 | .... | 1.60 | .... | 1 60 | 1.55 | 4,600 |
| Bullion, Nev | ..... | .... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Cashier | .50 | ..... | .50 | ..... | .... | ..... | .50 | ... | .49 | ... | .45 | .25 | 21,300 |
| Castle Creek, Id | .12 | .11 | .12 | ..... | .13 | .... | .11 | ... | .... | .... | .... | .... | 11,200 |
| Central Ariz., Ariz | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Columbia & Beaver | .... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Con. Imperial | ..... | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Con. Pacific | ..... | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Decatur | .... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Eastern Oregon | ..... | ..... | .02 | .... | .... | .... | .... | .... | .... | .... | .... | .... | 2,200 |
| El Cristo, U. S. Col | 2.75 | .... | 2.70 | 2.45 | .... | ..... | .... | ..... | 2.50 | .. | 2.40 | .... | 600 |
| Exchequer | 1.95 | .... | ..... | .... | 2.00 | ..... | .... | ..... | 2 40 | .... | 2.25 | .... | 400 |
| Found Treasure | .. | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | .... | .... | ..... |
| Hector | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Julia, Nev | .70 | ..... | .65 | .... | .70 | ..... | .75 | ..... | .90 | .... | .90 | ..... | 1,200 |
| Kossuth | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Lacrosse, Colo | .13 | .12 | ..... | ..... | .12 | .... | ..... | .... | .... | ..... | .13 | .12 | 4,800 |
| Mexican, Nev | 6.50 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Middle Bar, Cal | .... | .... | .30 | ..... | .30 | .27 | .30 | .29 | .30 | .... | .32 | .30 | 7,000 |
| Monitor | .... | .... | .14 | ..... | .... | .... | .14 | .13 | .14 | .13 | .14 | .13 | 2,700 |
| New Pittsb'g, Colo | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| North Stand'd, Cal | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| N. Horn-Silv'r, Ut | ..... | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Oneida Chief | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Ori'nt'l&Mil'r, Nev | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Phœnix of Arkan's | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Phœnix of Arizona | .... | .... | .... | .... | 2.50 | .... | .... | .... | .... | .... | .... | .... | 50 |
| Potosi | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Rappahann'k, Va | .22 | ... | .22 | .... | .22 | ..... | .21 | .20 | .20 | ..... | .21 | .19 | 3,200 |
| Red Elephant, Colo | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Renfrew, N. S | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Saint Kevin, Colo | .... | ..... | ... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| San Sebastian | .... | .... | .... | .... | .... | .... | 3.25 | .... | 3.25 | ..... | 3.25 | .... | 500 |
| Santiago, U. S. Col | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Security, Colo | 1.63 | 1.40 | 1.75 | 1.43 | 1.63 | 1.50 | 1.60 | 1.38 | 1.75 | 1.38 | 1.50 | 1.25 | 4,000 |
| Silver Cliff, Colo | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Silver Hill | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Silver Queen, Ariz | .... | .... | .04 | ..... | .... | ..... | .... | .... | .... | .... | .... | .... | 800 |
| Stanislaus, Cal | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| State L'e, 1&4, Nev | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| " Nos. 2 & 3. Nev | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Sutro Tunnel, Nev | .27 | .... | .27 | .21 | .24 | .22 | .28 | .24 | .28 | .24 | .25 | .22 | 42,540 |
| Taylor Plumas, Cal | .. | .... | .... | .... | .... | .... | .04 | .03 | .05 | .03 | .04 | .... | 15,600 |
| Tornado | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |
| Union Cons., Nev | .... | .... | .... | .... | .... | .... | .... | .... | 4.25 | .... | 4.25 | .... | 400 |
| Utah | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... |

*Dealt in at the New York Stock Exchange. Unlisted Securities.

# BOSTON MINING STOCK QUOTATIONS.

| NAME OF COMPANY. | Nov. 25. | | Nov. 26. | | Nov. 28. | | Nov. 29. | | Nov. 30. | | Dec. 1. | | SALES. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |
| Atlantic, Mich | ..... | ..... | ..... | ..... | 12.25 | 12 00 | ..... | ..... | 12.00 | ..... | 12.00 | ..... | 290 |
| Bodie, Cal | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Bonanza D | 1.25 | ..... | 1.25 | ... | 1.25 | ..... | 1½ | ..... | 1.25 | 1.13 | 1.19 | 1.13 | 3,700 |
| Boston & Mont., Mont | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Breece, Colo | .40 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 200 |
| Calumet & Hecla, Mich | 190 | 180 | ..... | ..... | 191 | 190 | 191 | 190 | 195 | 191 | 194 | .... | 556 |
| Catalpa, Colo | .26 | ..... | .27½ | .27 | .27½ | ..... | .27½ | ..... | .29 | 28 | .27 | ..... | 1,600 |
| Central | ..... | ..... | ..... | ..... | ..... | ..... | 12.50 | ..... | ..... | ..... | ..... | ..... | 10 |
| Con. Virginia, Nev | .. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Dunkin, Colo | 1.00 | ..... | 1.00 | .. | 1.02 | ..... | .. | ..... | 1.05 | 1.00 | 1.05 | ..... | 1,300 |
| Enterprise | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Eureka, Nev | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Franklin, Mich | 14.88 | 14.50 | 14.50 | ..... | 14.25 | 14.00 | 14.00 | ..... | 14.00 | 13.88 | 14.13 | 13.75 | 3,083 |
| Freeland, Colo | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Green, Mo | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Honorine, Utah | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Ironton Iron Co., Mich | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Kearsarge | 5.00 | ..... | 5.00 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 5.00 | ..... | 600 |
| Little Chief | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Napa, Cal | ..... | ..... | ..... | ..... | ..... | ..... | 1½ | ... | 1.38 | 1.25 | 1.25 | ..... | 1,200 |
| Osceola, Mich | 21.50 | 20.00 | 20.00 | 19.88 | 20 00 | ..... | 20.00 | 19.50 | 19.50 | 19.00 | 20.00 | 19.25 | 1,500 |
| Pewabic, Mich | 2 50 | ..... | 2.25 | ..... | 2.50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 275 |
| Quincy, Mich | 57.65 | 56 50 | ..... | ..... | 57.00 | 56.00 | 57.00 | 56.00 | 57.50 | 57.00 | 58.00 | ..... | 543 |
| Robinson, Colo | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Sierra, Nev | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Standard | 2.50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 100 |
| Stormont, Utah | ..... | ..... | ..... | ..... | .16 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 500 |

| NAME OF COMPANY. | Nov. 25. | | Nov. 26. | | Nov. 28. | | Nov. 29. | | Nov. 30. | | Dec. 1. | | SALES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |
| Allouez, Mich | 1.25 | ..... | 1.50 | 1.25 | 1 50 | .. .. | 1.50 | . .. | 1.63 | 1.37 | ..... | .... | 2,115 |
| Arnold, Mich | .50 | 47½ | .50 | .45 | ..... | ..... | .50 | 45 | ..... | ..... | ..... | ..... | 850 |
| Aztec | .10 | ... | .10 | ..... | .10 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 800 |
| Blue Ridge, Mich | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Bowman Silv'r, Nev | .04 | ..... | ..... | ..... | .04 | ..... | .04 | ..... | .05 | .04 | ..... | ..... | 4,100 |
| Brunswi'k | 1.60 | ... .. | 1.60 | ..... | 1 60 | ..... | 1.60 | ..... | ..... | ..... | 1.60 | ..... | 1,300 |
| Contentment | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Con. Pacific, Cal | .... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Crescent, Colo | ... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .11 | 10 | ..... | ..... | 700 |
| Cusi, N. Mex | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .19 | .17 | ..... | ..... | 1,700 |
| Empire | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .03 | ..... | 900 |
| Humboldt | ..... | ..... | ..... | 15 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 200 |
| Huron, Mich | 5.25 | 4.50 | 4.75 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 400 |
| Kossuth | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Mesnard | ..... | ..... | .32½ | ..... | .25 | ... .. | .30 | ..... | ..... | ..... | .35 | .30 | 1,150 |
| National, Mich | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1.00 | ..... | 1.00 | ..... | 250 |
| Oriental & M., Nev | ..... | ..... | ..... | .. | .15 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 100 |
| Pontiac | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .25 | ..... | 100 |
| Rappahannock, Va | .. | ..... | .22 | ..... | .21 | ..... | ..... | ..... | ..... | ..... | .19 | ..... | 1,800 |
| Ridge | ..... | .. .. | ..... | ..... | ..... | ..... | ..... | ..... | 1.25 | ..... | ..... | ..... | 350 |
| Security, Colo | ..... | .... | 1.50 | ..... | 1.50 | ..... | 1.50 | ... .. | 1.50 | ..... | 1.50 | ..... | 6 0 |
| South Side | .35 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1,100 |
| St. Louis | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .62½ | ..... | ..... | ..... | 200 |
| Sutro Tunnel, Nev | ..... | ..... | ..... | .29 | ..... | ..... | .23 | ... .. | 24 | ..... | .25 | ..... | 2,000 |
| Tamarack | 103 | 102 | 102 | ..... | 102 | 101 | 103 | ..... | 104½ | 103 | 107 | 104¾ | 700 |
| Washington | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Winthrop | ..... | ..... | ..... | ..... | .10 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 200 |

New York: Dividend shares sold, 22,799. Non-dividend shares sold, 125,990 Total New York, 148,789.
Boston: Dividend shares sold, 15,457. Non-dividend shares sold, 21,615. Total Boston, 37,072.

# COAL STOCKS.

| NAME OF COMPANY. | Par value of shares. | Nov. 26. | | Nov. 28. | | Nov. 29. | | Nov. 30. | | Dec. 1. | | Dec. 2 | | Sales. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | |
| Barclay Coal | ... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Cameron Coal | 100 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Ches. & O. RR | 100 | 4 | ..... | 4 | ... . | 4 | ..... | 4 | ..... | 4 | ..... | 4 | ..... | 1,750 |
| *Chic. & Ind. Coal RR | 100 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 45 | 43½ | 200 |
| Do. pref | 100 | ..... | ..... | ..... | ..... | ..... | ..... | 93 | ..... | ..... | ..... | ..... | ..... | 100 |
| Col. & Hocking Coal | 100 | 33 | 31½ | 32¼ | 30 | 31 | 27 | 29¾ | 29⅛ | 29⅛ | 28¾ | 29¾ | 29⅛ | 4.410 |
| Col., C. & I | 100 | 38⅜ | 37¾ | 38¼ | 36¾ | 38 | 36½ | 37⅞ | 37 | 37¼ | 36½ | 37½ | 37 | 5,075 |
| Consol. Coal | 100 | ..... | ..... | 25 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 100 |
| Cumb. C. & I | 100 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Del. & H. C | 100 | 106⅛ | 105⅜ | 106¾ | 105¾ | 105¼ | 104⅞ | 105⅜ | 103⅝ | 103 | 102 | 10 '¾ | 102⅝ | 9,912 |
| D., L. & W. RR | 50 | 133½ | 133 | 133⅝ | 132 | 132½ | 131⅛ | 132¼ | 130½ | 131 | 129¾ | 131⅝ | 130⅝ | 165,846 |
| Elk Lick Coal Co | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Hocking Valley | 100 | ..... | ..... | 26 | 25½ | 24¾ | 24 | 24¼ | ..... | ..... | ..... | 24¾ | ..... | 639 |
| Lehigh C. & N.† | 50 | 48 | 47¾ | 47⅝ | 47½ | 48 | 46½ | 46⅞ | ..... | 47¼ | 46¼ | ..... | ..... | 700 |
| Lehigh Valley RR.† | 50 | 55 | ..... | 55 | 54¾ | 55 | 54⅞ | 55 | 54⅞ | 55 | 54⅞ | ... | ..... | 701 |
| L. & W. C. & I. Co | .... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Marshall Con. Coal | 100 | ... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Maryland Coal | 100 | ..... | ..... | 15 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 100 |
| Montauk Coal | 100 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Morris & Essex | 50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| New Central Coal | 100 | ..... | ..... | 14½ | ..... | 14 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 200 |
| N. J. C. RR | 100 | 77¾ | 76½ | 77 | 75 | 76 | 74¾ | 76¼ | 76 | 75¼ | 74 | 75⅜ | 75 | 12,360 |
| N. Y. & S. Coal | 50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| N. Y., Susq. & Western | 100 | 9¾ | ..... | 9¼ | 9¼ | 9 | 8⅞ | 9 | 8⅞ | 9 | ..... | 9⅛ | 9 | 1,936 |
| Do. pref | 100 | 31 | ..... | 30¾ | 30½ | 30½ | 30¼ | 30½ | 30¼ | 29½ | ..... | 30 | 29¾ | 1,800 |
| N. Y. & Perry C. & I | 100 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Norfolk & Western R.R. | 100 | ..... | ..... | ..... | ..... | 16¼ | ..... | 15 | ..... | 14½ | ..... | ..... | ..... | 200 |
| Do. pref | 100 | 42¾ | 42 | 42¼ | 41⅜ | 41⅞ | 41½ | 42 | 41¾ | 41⅛ | 40½ | 42⅛ | 41⅞ | 7,046 |
| Penn. Coal | 50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Penn. RR.† | 50 | 55 | 54⅞ | 54⅜ | 54½ | 54⅛ | 54¼ | 54⅛ | 54 | 54¼ | 53⅞ | ..... | ..... | 7,382 |
| Ph. & R. RR.** | 50 | 70⅜ | 70 | 70¼ | 68½ | 69⅜ | 68 | 69½ | 68¾ | 68⅜ | 67½ | 69⅜ | 68⅝ | 474,420 |
| Spring Mountain | 50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Tennessee C. & I. Co | 100 | 30⅜ | 30 | 30 | 29 | 29½ | 28¼ | 29⅝ | 28½ | 29 | 28 | ..... | ..... | 2,710 |
| Westmoreland Coal† | 50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

** Of the sales of this stock, 87,195 were in Philadelphia, and 387,225 in New York.
† The quotations for these stocks are not percentage, but actual price.
Dealt in at the New York Stock Exchange Unlisted Securities.

Total sales, 697,587.

## San Francisco Mining Stock Quotations.

| COMPANY. | CLOSING QUOTATIONS. Nov. 25. | Nov. 26. | Nov. 28. | Nov. 29. | Nov. 30. | Dec. 1. | Dec. 2.* |
|---|---|---|---|---|---|---|---|
| Alpha | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Alta | 3.05 | 2.90 | 2.65 | 2.35 | 2.45 | 2.30 | ..... |
| Argenta | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Belcher | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Belle Isle | .65 | .60 | .85 | .60 | ..... | ..... | ..... |
| Best & Bel | 8⅝ | 7⅞ | 7¼ | 7¾ | 8 | 8⅜ | ..... |
| Bodie | 2 70 | ..... | 2.60 | 2.40 | 2.60 | 2½ | ..... |
| Bulwer | 1 | .90 | .90 | ..... | ..... | ..... | ..... |
| Chollar | 6¾ | 6¼ | 6 | 6⅜ | 6¾ | 6⅛ | ..... |
| Com'nwlth | ..... | 2½ | 2½ | ..... | 2.85 | 2 85 | ..... |
| Con.C.& V. | 24 | 22½ | 21 | 21 | 22¾ | 23¼ | ..... |
| Con. Pac | ..... | ..... | ..... | ..... | 20 | ..... | ..... |
| Crown Pt. | 10⅝ | 9¾ | 9⅝ | 9⅝ | 10 | 9.75 | ..... |
| Eureka C. | ..... | 6½ | 6⅝ | 6⅝ | ..... | ..... | ..... |
| Gould & C. | 5½ | 4.95 | 5¼ | 5¾ | 5⅝ | 5⅝ | ..... |
| Hale & N. | 5 | 4.85 | 5 | 5½ | 6¼ | 5¾ | ..... |
| M. White | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Mexican | 6¾ | 5⅞ | 5⅛ | 5⅞ | 6 | 6¼ | ..... |
| Mono | 2.15 | 2.10 | 2.15 | 2.65 | 2¼ | 2.05 | ..... |
| Mt. Diablo | ..... | 4½ | ..... | ..... | ..... | ..... | ..... |
| Navajo | ..... | ..... | ..... | ..... | .90 | ..... | ..... |
| Nev. Queen | 3.35 | 3.20 | 3.30 | 3.20 | 3¼ | 3.30 | ..... |
| N. Belle I. | 8 | 8 | 7¾ | 8 | 8 | 8 | ..... |
| Ophir | 12 | 10⅞ | 9⅞ | 10⅝ | 10⅝ | 11½ | ..... |
| Potosi | 8⅛ | 7½ | 7 | 7¾ | 7⅞ | 7⅞ | ..... |
| Savage | 8⅝ | 7⅞ | 7½ | 7⅞ | 8½ | 8 | ..... |
| Scorpion | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Sierra Nev. | 6¼ | 6⅝ | 5⅝ | 5⅝ | 6⅛ | 5⅞ | ..... |
| Sutro Tun | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Tip Top | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Union Con. | 4⅛ | 4¼ | 3.90 | 3.90 | 4.10 | 4.15 | ..... |
| Utah | 2 40 | 2.15 | 2.05 | 2 20 | 2¼ | 2.20 | ..... |
| Yellow Jkt. | 7¼ | 6¾ | 6⅝ | 6½ | 6⅞ | 7⅛ | ..... |

* No quotations.

## IRON MARKET REVIEW.

NEW YORK, Friday Evening, Dec. 2.

There is little change to note in the general condition of the iron market, and very little new business is reported. Consumers generally appear to be in no hurry to anticipate their wants for next year, and strong producers are not pushing their goods for sale.

American pig-iron is unchanged, with No. 1 brands still scarce and in demand. No. 2 iron is firm and not plenty. Forge brands continue easy.

The general opinion among those best informed is that there is little prospect of any reduction of prices of Foundry brands in the spring. This opinion is strengthened by the generally firmer tone of the steel rail market, in which eastern mills will not quote below $32@$33 at mill for spring delivery.

The opinion gains ground that the demand for steel rails in 1888 will certainly equal three fourths of the demand in 1887, and with the percentage allotment system adopted by the rail mills, there is no danger of much competition for orders. There is no doubt that the rail mills have a great deal of business in sight. There are many *bona fide* inquiries about, and the Pennsylvania order of about 50,000 tons will doubtless be placed very soon, which will break the ice.

The rail-makers generally would like to have all the mills closed during January for repairs, also to give the railroads an opportunity to digest the idea that their prosperity will not be enhanced by squeezing the price of rails down to the lowest possible notch, entailing reductions of wages, and cutting off traffic in various ways.

Scotch irons are practically unchanged here, though a little firmer abroad.

Bessemer pig and spiegel are lifeless, and quotations are nominal.

There is rather more inquiry for Wire Rods, with some business and a good outlook. The German makers have established a common agency for their sales both at home and abroad. Quotations are only given here subject to cable confirmation.

The makers of structural iron continue very busy with deliveries. There is a little present slackening of orders, but plenty of work ahead.

Old rail quotations are purely nominal, as strong holders will not sell at prices to-day obtainable. We hear of a sale of 500 tons double heads at $21, and an equal amount offered at same price.

On the other hand, about $21.50 is bid for tees, and declined.

NOTE.—Our quotations of cable prices of Scotch irons to the Metal Exchange last week were a repetition of those of the preceding week. The exchange did not receive its usual cable message last Friday.

**Louisville.** Nov. 29.

[Reported by GEO. H. HULL & CO.]

The Louisville pig-iron market for the last week has been the dullest of the season. Very little iron has been sold, and there is great divergence as to prices between the views of furnaces and the buyers. A general view of the situation presents no satisfactory reason for the present weakness of the market, and the outlook is very uncertain; the bulk of opinion being that it will improve, but many well informed persons believing, on the other hand, that the depression will continue. There is no immediate prospect of any of the new furnaces going into blast and changing the situation. Prices remain unchanged and will be found in our weekly register of prices.

**Philadelphia.** Dec. 2.

[From our Special Correspondent.]

The iron market has been unusually quiet during the past six days. It is a question whether if pig-iron makers offered material cheap it could be sold in large quantities. Buyers have suddenly shown a disposition to hold off. There is no good reason given for it. Prices have not weakened. Standard and special brands are as scarce as ever, just as much good iron is being melted up as at any time, and there are no indications that there will be a falling off in either consumption or demand. Makers are in no wise disconcerted at the present dullness and do not fear any reduction in prices, but will stock up if necessary and wait for demand to show itself. Quotations have not been changed and there is no shading on selling prices, unless on occasional lots of inferior makes of both foundry and forge. Very little Southern iron is either coming in or is asked for. The West seems to be running in orders at Southern furnaces. Inquiries in this market show no anxiety upon the part of agents to pick up business. The mills are all busy and good forge irons command full prices. There is no likelihood of any change between now and the holidays. It is the intention of several large consumers of both foundry and forge iron to wait until January before entering into new contracts. A great deal of iron will then be either bought or contracted for, as many contracts will be terminated by the close of this year. The furnace companies who contemplated blowing out will not do so at present. The undertone of the market is very stong, and an increasing demand seems generally to be anticipated early in the year. In all kinds of foreign material there is scarcely any thing doing, although brokers have a few inquiries which look favorable for large transactions in a short time. No change in quotations is given. Some little spiegel has been sold. American Bessemer has been in good demand, and most of the furnaces have contracts in process of execution. Muck bars have not changed, and prices are very firm at the usual figures. Fewer small iron orders have been placed, and brokers and manufacturers say the outlook for the first quarter of next year is even better than a month ago. Large car orders are awaiting acceptance at car building works. A good deal of locomotive work has come in this month, and railroad companies are arranging to place large orders for locomotive power next month. Agents who are well posted and who have been traveling throughout the State during the past week or ten days give very encouraging prospects of the iron and steel demand for next quarter. Nails are dull at the usual quotations. Building operations are still actively prosecuted, but buyers are purchasing in a hand to mouth way. A half dozen good plate and tank iron orders were placed, but in a general way business is light. It is stated that early in the year there will be some very heavy orders in wrought-iron pipe placed. Structural iron makers report things rather quiet, but mills busy. Quotations unchanged. The sheet iron makers report no new business and but little inquiry. Merchant steel makers are busy on specialties, and are booking orders for winter work at full prices. The entire iron trade seems to be in a very healthy condition, although there is no rushing demand. There is an improving confidence in all branches. Several good sized rail orders were placed this week. Sales are estimated at 150,000 tons for the week, but the figures can not be authenticated. Buyers are beginning to come in. The rail makers feel quite confident that they will be able to hold prices they have informally agreed upon. Four or five large buyers are said to be closing negotiations for large lots. Buyers are offering $22@$22.25 for old rails, but brokers claim they can not fill orders at less than $22.50. Scrap is more active, especially for selected and No. 1. Quotations will be found in our weekly register of prices.

**Pittsburg.** Dec. 1.

[From our Special Correspondent.]

The iron market at this time is so unsettled that any thing like a satisfactory report is very difficult to furnish, for the simple reason you scarcely find two dealers that have the same views in regard to the present or the future of the iron trade. As regards new features, there are none, the position varying but little since that of our last report. The advantages are certainly on the side of buyers, who don't seem in any hurry to take any advantage of sellers. While the stock of raw iron is not large, buyers find no difficulty in supplying their demands. The absence of large buyers don't seem to be felt to any extent, nor cause any accumulation of stock, so that it would be reasonable to infer that consumption keeps well in line with production, This, however, has been the situation for some time, and is likely to continue so for the present, and there is nothing in sight yet upon which to base any prediction for material change. At the present time raw iron is duller in this market than any other East, West or South, if the reports received are correct, and we see no reason for doubt. Well-informed parties, who have visited furnaces at various places, report stocks exceedingly light. Business in crude iron is of an entirely hand to mouth character at present, and from good authority it seems probable that heavy transactions will not be indulged in until after the new year has been inaugurated. Certain buyers appear pretty well stocked up, and makers of iron are not anxious to book heavy orders for winter and spring delivery at present prices. Very little Southern iron is being sent to these parts, owing to the demand that is flowing in from the West. Many of the Southern furnaces are sold ahead. The main point for consideration is the question of consumption. This opens such a field for conjecture that it seems impossible to cover the ground properly.

SALES REPORTED SINCE OUR LAST.

| | |
|---|---|
| *Coal and Coke Smelted Lake Ore.* | |
| 500 Tons Bessemer | 19 00 cash. |
| 500 Tons No. 1 Mill | 17.25 cash. |
| 500 Tons Bessemer | 19.25 cash. |
| 500 Tons Good Neutral Mill | 17.25 cash. |
| 200 Tons Gray Forge | 17 25 cash. |
| 150 Tons Bessemer | 19 00 cash. |
| 100 Tons White and Mottled Bessemer | 17.25 cash. |
| 100 Tons Bessemer | 19.50 4 mo. |
| 150 Tons No. 1 Foundry, all ore | 20.75 4 mo. |
| 100 Tons Bessemer | 19.65 4 mo. |
| *Coke, Native Ore.* | |
| 500 Tons No. 1 Mill Cold Short | 16.50 cash. |
| 100 Tons No. 1 Foundry | 19.25 cash. |
| 60 Tons No. 1 Foundry | 19.65 4 mo. |
| 100 Tons No. 2 Foundry | 19.00 4 mo. |
| 50 Tons Silvery | 19.00 cash. |
| 100 Tons Gray Forge | 17.25 cash. |
| *Muck Bar.* | |
| 500 Tons Good Neutral | 30.00 cash. |
| 400 Tons Good Neutral | 30.25 cash. |
| 250 Tons Good Neutral | 30.25 cash. |
| *Steel Billets.* | |
| 400 Tons Billets | 29.50 cash. |
| *Steel Rail Ends.* | |
| 500 Tons Rail Ends | 20.50 cash. |
| *Old Iron Rails.* | |
| 600 Tons Inspected Ts | 24.75 cash. |
| 500 Tons Inspected D. H | 25.25 cash. |
| *Scrap Material.* | |
| 100 Tons No. 1 Wrought Scrap, net | 20.00 cash. |
| 75 Tons Cast Scrap, gross | 17.50 cash. |
| 75 Tons Cast Borings, gross | 13.00 cash. |

## FINANCIAL.

NEW YORK, Friday Evening, Dec. 2.

### The Condition of Trade.

The state of general trade throughout the country is somewhat improved at various points, mainly at New Orleans, Savannah, and in the Northwest, though with some exceptions this is true solely in retail lines, due to the approach of the holidays. The ending of the drouth in the Ohio Valley is also responsible for some gain in the movement of general merchandise, more particularly in Southern Ohio, Indiana, Illinois, and in Northern Kentucky. Staple cotton goods continue in exceptionally active request at firm prices. Woolens are unchanged. Petroleum is firm at late advances, based on reduced production. Wheat is higher and active on good speculative and export demand. Indian corn, too, has advanced on the short crop here and in Europe, and oats participate in the stronger feeling with higher prices. Cotton has been higher on the low crop reports of the government and the New Orleans *Cotton World*, and the trade are awaiting with much interest *Bradstreet's* estimate, which is due to-morrow. Hog products are firm at higher quotations, owing largely to the higher price and the outlook for Indian corn.

The industrial situation has not changed materially. Actual efforts are being made to call off the strike in the Lehigh coal mining regions, but thus far nothing definite has resulted, although arbitration is being seriously talked of. The output of anthracite coal from January 1st to date, in spite of restricted output in the Lehigh (where nearly one-quarter of the total Philadelphia output has generally been obtained), remains about two million tons in excess of the output in a like portion of 1886. With the reduced stocks taken into account, the indications are that the consumption of anthracite this year is about that much in excess of the quantity used to a corresponding date last year; and with the late activity in mining maintained until Christmas, the prospects favor a total of about 34,000,000 tons for 1887, or 2,000,000 tons in excess of 1886. This points to a material extension of the domestic consumption of this variety of fuel, when the reported inroads on anthracite by bituminous, for steam-making purposes, are considered. The scarcity of cars in the Pennsylvania coke regions is hampering shipments a good deal, and has had, and is still having, some effect on the production of iron in Ohio in consequence.

The condition of the pig-iron market has not changed much. At the East best brands continue to be quoted at figures which have prevailed for a long time, but the demand is slow. Rails are low and in poor demand, and a number of Eastern mills are idle in consequence. The official organ of the Philadelphia Iron and Steel Association complains that a part (at least) of the late decline in the price of steel rails is due to the attitude of officials of railroad companies in holding back orders for steel rails which they will, in reality, be obliged to buy for 1888 delivery, and calls upon them to consider the possible effects upon industry and trade at large by such a (mistaken?) course, and to place such orders as they may have. This is a rather peculiar attitude to take, and is certainly a strange allegation to make. Its effect, if any, will be awaited with interest. The iron markets at St. Louis and elsewhere West are quoted nominally a little firmer, but there is thus far little reported new business. The outlook, however, is considered by leading members of the trade in that portion of the country to be very satisfactory, as the estimated requirements early next year are considerable. The "French syndicate," accused of cornering tin, are alleged to be responsible for the further advance in the price of that article, and are said to have turned their attention to American copper and spelter thus far with apparently profitable results.

The money markets remain as a rule slightly firmer than during weeks previous to last week, with a tendency on the part of loan rates at many points to advance slighily. At New York all loan rates are quoted at 4@5 per cent, and best commercial paper at 6, with rather less funds offering on this variety of collateral than recently. London Exchange, sight, is quoted at the close at $4.84½@$4.84¾.

### The Coal Road Stocks.

Speculation at the New York Stock Exchange continues quite active, but Reading has not held its preceding firmness quite as well as was to be expected considering the news that it is to be taken out of the hands of the receivers, and be accounted a possible dividend-payer in the near future. Jersey Central's good fortune of a similar nature has also been conspicuous as not having had any marked effect on the price of its shares. Erie's good financial report has greatly encouraged its friends. On the whole, however, the coal road shares have been well sustained. Reading has declined 1⅛ points; Jersey Central, 3¼ points; Delaware, Lackawanna & Western, 2⅝; Delaware & Hudson, 2⅛; and Erie, ⅞. The extra dividend of the Pennsylvania & New York has been received abroad with delight.

### Mining Stocks.

The developments in the mining market during the past week have been without special significance, the tendency being on the whole toward a lower level, with an almost complete elimination of the bull feeling, except in respect to a few shares that are known to be controlled by a few wily manipulators, who can shift prices up and down at will. Much of the lack of interest has been caused by the erratic doings of Sutro Tunnel, which has during the week dropped as low as 22 cents.

Tortilita is still as dumb as an oyster, and the insiders have not declared their readiness to undergo the tortures of the inquisition by the Consolidated Stock and Petroleum Exchange.

Rappahannock shows a further decline, and sold to-day at 19c.

El Cristo continued the downward movement shown toward the close of last week, and has been selling as low as $2.40 this week.

Castle Creek was quite actively dealt in at the beginning of last week, when it sold at from 11c. to 13c., but no sale has been made since Wednesday.

In Amador there has been little doing of late, and the same has been the case with its twin-brother,

Middle Bar. While the latter has been gradually sinking towards the lowest level yet reached and attracting not the slightest interest, selling at from 27c. to 32c., the former the past day or two shows a decided advance on paper, going from $1.40 to $1.80.

Brunswick holds its own at from $1.55@$1.60. Plymouth Consolidated was firm at from $18.50@$19.

Quicksilver Preferred was active, advancing from $28.75@$33.50, with sales of 3800 shares. Common also attracted considerable attention, and went from $6@$9.

Taylor-Plumas has been strong and a fair demand has been shown for the stock, which has been selling at from 3 to 5c. Green Mountain shows a sale at 4c.

Standard has declared a dividend of $5000 and an extra dividend of the same amount. The stock is strong, and the price steady at from $2.10 to $2.50. Bodie Consolidated was quiet at from $2.50 to $2.60.

Silver King opened at $5.13, and sold to-day at $4.50.

The price of San Sebastian remained unchanged at $3.25.

During the week we noticed that Phœnix, of Arkansas, was again receiving some little attention, at least the stock was named as having been offered at $2.50. It appears strange that no bids are made for the stock at any time, which certainly would not be the case were any of the stock held outside Phœnix office.

The stock of the Helena Mining and Reduction Company sold at $1.

Iron Hill records sales at from $2.25@$2. Homestake from $12.25@$12.75. Caledonia appeared on the list toward the end of the week, selling at from $1.70@$1.80. Deadwood was quiet at $2.60.

Cashier, with which the manipulators created a big boom some time ago, has been quiet for several weeks past. This week the price opened at 50c., and to-day there was a sudden drop to 25c.—some 21,300 shares changing hands. Security also showed a lower movement, and went from $1.75 to $1.25. Monitor was steady and 13c. and 14c. Lacrosse at 12c. and 13c. Colorado Central shows a sales of 100 shares at $2.10 per share. Iron Silver at $2.80. Robinson Consolidated at from 35c. to 40c.

Horn Silver, for the first time in many months, demanded some attention, and advanced from 89c. to $1.05. We understand that a report is to be issued in January.

Sutro Tunnel was again the most active stock on the list, and in consequence of the pending assessment declined to 22c., the total transactions of the week amounting to 42,540 shares. Consolidated California & Virginia sold as low as $21 on Monday, but toward the close of the week the price advanced again to $23.37, the stock selling to-day at $22.63. Sierra Nevada shows one sale at $5.75. Savage, a few with higher prices at from $7.88 to $8.38. Ophir is quoted at $11.75 Hale & Norcross at from $5@$5.63, Gould & Curry from $5.13@$6, Chollar at from $6.25@$6.13, Belcher at $11.50, Union Consolidated at $4.25. Julia advanced from 65@90c., and Exchequer from $1.95@$2.40.

Eureka shows a sale at $6.88.

The Tuscarora stocks were neglected, but one sale of Navajo is reported at $1. Of Belle Isle a few at from 75@65c.

### Auction Sale of Stocks.

The following securities were sold at auction in this city November 29th: 100 shares Pennsylvania Coal Company, 260; 72 shares Delaware, Lackawanna & Western Railroad Company, 130¾; 30 shares Delaware & Hudson Canal Company, 104⅞; 156 shares Pennsylvania Coal Company, 258; 5 shares Pennsylvania Coal Company 281½; $1600 Central Railroad of New Jersey first-mortgage 7 per cent bonds, 107; 17 shares New York Alkali Company, $8 per lot; 80 shares American Steel Spring Manufacturing Company, $8 per lot; 100 shares Llangollen Mining Company, $8 per lot; $1000 Pennsylvania Bituminous Coal and Iron Company, March, 1860, coupons on, $8 per lot; 100 shares Sutro Tunnel Company, 24c. per share; 150 shares Oriental Gold Mining Company, $14 per lot; 100 shares Nevada Steam Mining Company, $1.

### Dividends.

Bridgewater Natural Gas Company, of Pennsylvania, has declared a dividend, No. 21, of one per cent, payable November 30th.

Charleston, S. C., Mining and Manufacturing Company has declared a quarterly dividend of two dollars and a half per share and an extra dividend of one dollar per share, payable December 1st, at No. 132 Walnut street, Philadelphia, Pa.

Delaware & Hudson Canal Company has declared a quarterly dividend of one and one quarter per cent' payable December 15th, at the National Bank of Commerce, New York City.

Moulton Mining Company, of Montana, has declared a dividend, No. 13, of seven and one half cents per share, or $30,000, payable December 5th, at the American Loan and Trust Co., No. 113 Broadway, New York City.

Russell Reduction and Mining Company, of California, has declared a dividend, No. 6, of five cents per share, or $5,000, payable November 28th, at No. 328 Montgomery street, room 24, San Francisco, Cal.

Standard Consolidated Mining Company, of California, has declared dividend No. 68, of five cents per share, and also an extra dividend of five cents per share, in all $10,000, payable December 12th, at the Farmers' Loan and Trust Company, New York City.

### Assessments.

| COMPANY. | No. | When levied. | D'l'nq't in office. | Day of sale. | Am't per share. |
|---|---|---|---|---|---|
| Alta, Nev. | 36 | Nov. 29 | ..... | ..... | .50 |
| Atlantic Cons., Nev. | 6 | Oct. 18 | Nov. 21 | Dec. 8 | .10 |
| Bannock, Idaho | .. | Oct. 22 | Dec. 2 | Dec. 19 | .25 |
| Bellevue-Idaho, Id. | .. | Nov. 15 | Dec. 21 | Jan. 10 | .25 |
| Canadian | .. | Nov | Dec. 12 | ..... | .05 |
| Chicago M. & M. Co. | .. | Nov. 9 | Dec. 11 | Dec. 27 | .10 |
| Elk Mt., Dak | 4 | Nov. 8 | Dec. 8 | Dec. 28 | .002½ |
| Florence, Dak. | 2 | Nov. 1 | Dec. 1 | Dec. 28 | .001½ |
| Found Treasure, Nev | 1 | Nov. 5 | Dec. 10 | Dec. 30 | .06 |
| Golden Fleece, Cal. | 11 | Oct. 15 | Dec. 7 | Jan. 4 | 10.00 |
| Golden Prize, Nev. | 8 | Oct. 4 | Nov. 4 | Dec. 5 | .40 |
| Gould & Curry, Nev. | 57 | Oct. 28 | Dec. 2 | Dec. 27 | .50 |
| Guadalupe, Cal | 2 | Oct. 21 | Nov. 25 | Dec. 12 | .05 |
| Heath, Idaho | 2 | Nov. 4 | Dec. 10 | Dec 30 | .05 |
| Hester, A., Dak | .. | ..... | Nov. 19 | Dec. 10 | .01 |
| Himalaya, Utah | 2 | Oct. 10 | Nov. 10 | Dec. 12 | .005 |
| John Duncan, Mich. | .. | Nov. 18 | Dec. 20 | Dec. 20 | .25 |
| King of the West, Ida. | 2 | Oct. 19 | Nov. 23 | Dec. 10 | .15 |
| Missoula, Utah | 2 | Oct. 11 | Nov. 15 | Dec. 5 | .02 |
| Monarch, Dak. | .. | ..... | Dec. 8 | Dec. 24 | .02 |
| Mountain, Cal. | 26 | Nov. 14 | Dec. 16 | Jan. 4 | .01 |
| Mutual, Dak. | 3 | Oct. 3 | Nov. 12 | Dec. 12 | .01 |
| New Coso, Cal. | 21 | Oct. 19 | Dec. 1 | Dec. 26 | .10 |
| Oxford, Dak | 1 | Nov. 5 | Dec. 6 | Dec. 26 | .01¼ |
| Pocahontas, Dak. | 5 | Nov. 15 | Dec 17 | Jan. 3 | .005 |
| Potosi, Nev. | 29 | Nov. 30 | ..... | ... | .50 |
| Rattler-Gilroy, Dak. | .. | ... ... | Dec. 8 | Dec. 27 | .01½ |
| Rochester, Utah | .. | Sept. 19 | *N'v. 20 | *Dec 5 | .05 |
| Rubicon, Dak. | 2 | Nov. 23 | Dec. 27 | Jan. 20 | .00? |
| Scorpion, Nev. | 22 | Oct. 7 | Nov. 11 | Dec. 5 | .10 |
| Seabury-Calkins, Dak. | 7 | Oct. 27 | Dec. 1 | Dec. 20 | .01½ |
| Segreg. Iron H., Dak | 2 | Oct. 17 | Nov. 20 | Dec. 7 | .01 |
| Silver King, Dak | 1 | Nov. 10 | Dec. 10 | Dec. 28 | .002½ |
| Sugar Loaf Hill, Dak | 2 | Oct. 17 | Nov. 17 | Dec. 3 | .001 |
| Union Cons., Nev. | 36 | Nov. 10 | Dec. 15 | Jan. 3 | .50 |

*The delinquent day and the day of sale were postponed to dates given above.

### Pipe Line Certificates.

The following table gives the quotations and sales at the Consolidated Stock and Petroleum Exchange:

| | Opening. | Highest. | Lowest. | Closing. | Sales. |
|---|---|---|---|---|---|
| Nov. 26 | 74⅜c. | 74¾c. | 74⅛c. | 74¾c. | 189,000 |
| 28 | 74⅛ | 74¾ | 72⅞ | 74⅛ | 2,013,000 |
| 29 | 74⅜ | 74⅝ | 73¾ | 74 | 1,093,000 |
| 30 | 74⅛ | 74⅞ | 74⅛ | 74⅝ | 738,000 |
| Dec. 1 | 74¼ | 75¼ | 73⅛ | 75⅛ | 2,250,000 |
| 2 | 75½ | 76½ | 75⅛ | 76 | 4,019,000 |
| Total sales in barrels | | | | | 10,302,000 |

### Boston Mining Stocks. Dec. 1.

[From our Special Correspondent.]

The week opened with a regular booming market for copper stocks incident on the continued advance of ingot copper, and for a day or two it looked as if very much higher prices would be reached than heretofore, but there seems to be a lack of confidence in the permanency of the rise in ingot, and a fear that a sudden collapse in the speculation might come any day, which has had a tendency to keep buyers a little timid, and to restrict orders to realizing on recent purchases, causing the offering of stock to be quite free and a consequent decline from the highest prices of the week. The tight money market has also had its influence on the market, as banks and trust companies, as a rule, will not loan money on this class of collaterals. The business of the week has been the largest for any of the year, and if the market for ingot copper was settled upon a permanent basis much more activity and higher pricees would undoubtedly be realized.

Calumet & Hecla, notwithstanding the bad condition of affairs at the mine, records an advance from the lowest point touched, viz., $185, to $195, with later sales at $194. Sales over 500 shares for the week and principally in small lots.

Franklin has been very active, advancing to $14¾ @$14⅞ in the early dealings, with a subsequent decline to $13¾. Sales, 2500 shares.

Osceola opened at $21¼ and declined to $19. Sales about 1200 shares.

Quincy has been firm, advancing to $57⅝ and has been very steady at $57½.

Tamarack has been quite largely dealt in, with a better demand for the stock, and advanced from $100 to $104¾, closing at the highest price for the week.

Many of the smaller companies have been dealt in and we note sales of Allouez at $1¼ to $1⅜. Ridge, $1¼.

Pewabic at $2¼@$2½; Mesnard, 25@30c.; So. Side 30@35c.; Arnold, 45@50c.; Huron sold at $5¼; Kearsarge at $5; Central at $12½; Atlantic at $12@ $12½. Pontaic, 25c.; St. Louis Copper, 62½c., and we look for a good market for all the speculative list during the winter.

The silver stocks have been very dull and inclined to lower prices. Dunkin is an exception and is in good demand at $1. A dividend will probably be declared during the present month, as the company have about $50,000 on hand. "Cusi" has ruled heavy with a declining tendency. It was offered to-day at 16c. without takers. Catalpa steady at 25@27½c. Bonanza a shade firmer than last week, with sales at $1¼@$1⅜. Napa Quicksilver advanced from $1⅛ to 1⅜ on sales of 800 shares.

At the afternoon call the market showed an upward tendency and a firmer feeling. Franklin advanced to $14½; Osceola to $20; Tamarack to $107, while Calumet & Hecla was steady at $194.

Closing prices, 3 P. M.: Allouez, $1⅜@$1½; Atlantic, $11½@$12; Franklin, $14@$14¼; Quincy, $58@$59; Osceola, $20@20½; Tamarack, $106@$107.


## CONTRACTS OPEN.

*See also page xix.*

**665** IMPROVEMENT OF THE HARBOR of Pernambuco, Brazil. Address the Brazilian Legation at Washington, or the Brazilian Consulate General in New York, until January 31st.

TO COAL OPERATORS.—THE SUBSCRIBER has for sale 4000 acres of Coal Land in the Swift Creek Basin of the Richmond Coal Field.

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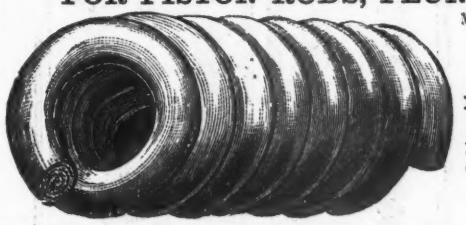

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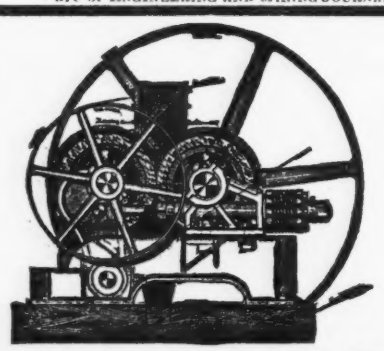

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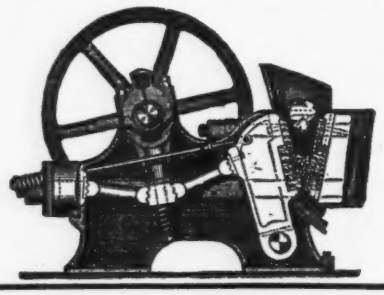

## DIVIDENDS.

PLYMOUTH CONSOLIDATED GOLD MINING COMPANY, 23 NASSAU STREET,
NEW YORK, Nov. 12, 1887.
DIVIDEND NO. 55.

The Board of Trustees have declared a dividend of FORTY THOUSAND DOLLARS, the same being *forty cents* per share of the capital stock of the company, payable on the 5th day of December at the Company's offices in New York and San Francisco. W. VAN NORDEN, President.

COLORADO CENTRAL CONSOLIDATED MINING COMPANY.—The regular dividend, No. 19, of FIVE CENTS per share ($13,750) has been declared to the stockholders of this company, payable on December 10th, at the Farmers' Loan and Trust Company. Transfer-books close on November 30th, reopening on December 12th. R. V. MARTINSEN, Treasurer.
NEW YORK, Nov. 10, 1887.

OFFICE OF THE STANDARD CONSOLIDATED MINING COMPANY,
SAN FRANCISCO, Cal.

The Tranfer-Books of the stock of this company will close on December 2d, 1887, for the monthly dividend of FIVE CENTS a share. Also an extra dividend of FIVE CENTS a share, payable December 12th, 1887, at the office of the Farmers' Loan and Trust Company, 20 and 22 William street, New York.

The Transfer-Books open December 13th, 1887.

J. W PEW, Secretary.

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